



CTC Laboratories, Inc.



中国认可
国际互认
检测
TESTING
CNAS L5365

Report No.: CTC2025222570

TEST REPORT

Product name : Tempereture and Humidity Sensor T1

Trademark : Aqara

Model No. : WSDCGQ12LM, WS-S01, WSDCGQ12LM-G0, TH-S02D

Applicant : Lumi United Technology Co., Ltd

Address of applicant : Room 801-804, Building 1, Chongwen Park, Nanshan iPark,
No.3370, Liuxian Avenue, Fuguang Community, Taoyuan
ResidentialDistrict, Nanshan District, Shenzhen, China

Test date : 2025-03-24 to 2025-03-26

Date of issue : 2025-03-28

| |
|-----------------------------------|
| Test result : Pass * |
|-----------------------------------|

* In the configuration tested, the EUT complied with the standard **EN IEC 62368-1:2020+A11:2020, BS EN IEC 62368-1:2020+A11:2020, AS/NZS 62368.1:2022, IEC 62368-1:2018**.

This test report consists of total 90 pages main report and attachments. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CTC. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CTC within 15 days since the date.

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China Inspection And Testing Society:
yz.cnca.cn

Page1 of 90



TEST REPORT
IEC 62368-1

Audio/video, information and communication technology equipment
Part 1: Safety requirements

Report Number : CTC2025222570

Tested by (+ signature) : Bosco Li

Bosco Li

Compiled by (+ signature) : Hardy Huang



Approved by (+ signature) : Totti Zhao

Date of issue : 2025-03-28

Name of Testing Laboratory preparing the Report : **CTC Laboratories, Inc.**

Applicant's name : See cover page

Address : See cover page

Test specification:

Standard : IEC 62368-1:2018
EN IEC 62368-1:2020+A11:2020
BS EN IEC 62368-1:2020+A11:2020
AS/NZS 62368.1:2022

Test procedure : Test report

Non-standard test method : N/A

Test Report Form No. : CTC-TR-154_A1

Test Report Form(s) Originator : UL(US)

Master TRF : Dated 2024-09-20

Copyright © 2022 IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE System). All rights reserved.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory.

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



| | |
|------------------------------------|--|
| Test item description | Tempererature and Humidity Sensor T1 |
| Trade Mark(s) | |
| Manufacturer | The same as applicant |
| Model/Type reference | WSDCGQ12LM, WS-S01, WSDCGQ12LM-G0, TH-S02D |
| Ratings | 3V--- (Supplied by button battery) |
| Sample number | CTC250225-016-S003, CTC250225-016-S004 |



CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China
Inspection And Testing Society: yz.cnca.cn

**List of Attachments (including a total number of pages in each attachment):**

Attachment 1: European group differences and national differences (page 59 to page 77)

Attachment 2: Australia/New Zealand national differences (page 78 to page 85)

Attachment 3: Photo Documentation (page 86 to page 90)

Summary of testing:

Tests performed (name of test and test clause):

All applicable tests as described in Test Case and Measurement Sections were performed.

Following tests performed during evaluation

| | |
|----------------------------|--|
| 4.8.4 | Battery Compartment Mechanical Tests |
| 4.8.5 | Battery Accessibility |
| 5.2 | Classification of electrical energy sources |
| 5.4.1.4, 9.3, B.1.5, B.2.6 | Maximum operating temperatures for materials, components and systems |
| 6.2.2 | Power source circuit classifications |
| Annex B.2.5 | Input Test |
| Annex B.3 & B.4 | Abnormal operating and fault condition tests |
| Annex F.3.10 | Durability, legibility and permanence of markings |
| Annex M.3 | Protection circuits for batteries provided within the equipment |
| Annex T.5 | Steady force test, 250N |
| Annex T.6 | Enclosure impact test |
| Annex T.8 | Stress relief test |

Note:

If not otherwise specified, tests were performed on model TH-S02D to represent other similar models.

The submitted sample was found to comply with the requirements of above tests.

Testing location:**CTC Laboratories, Inc.**

Room 101 of Building B, Room 107, 108, 207, 208 of Building A, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

**Summary of compliance with National Differences:**

EU Group Differences, EU Special National Conditions,
AU, CA, DE, DK, FI, FR, GB, IE, NO, NZ, SE,

Explanation of used codes:

AU=Australia, CA=Canada, DE=Germany, DK=Denmark, FI=Finland, FR=France,
GB= United Kingdom, IE=Ireland, NO=Norway, NZ>New Zealand, SE=Sweden

- The product fulfils the requirements of EN IEC 62368-1:2020+A11:2020, BS EN IEC 62368-1:2020+A11:2020, AS/NZS 62368.1:2022, IEC 62368-1:2018.**

Use of uncertainty of measurement for decisions on conformity (decision rule):

No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

Other:.... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:

The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

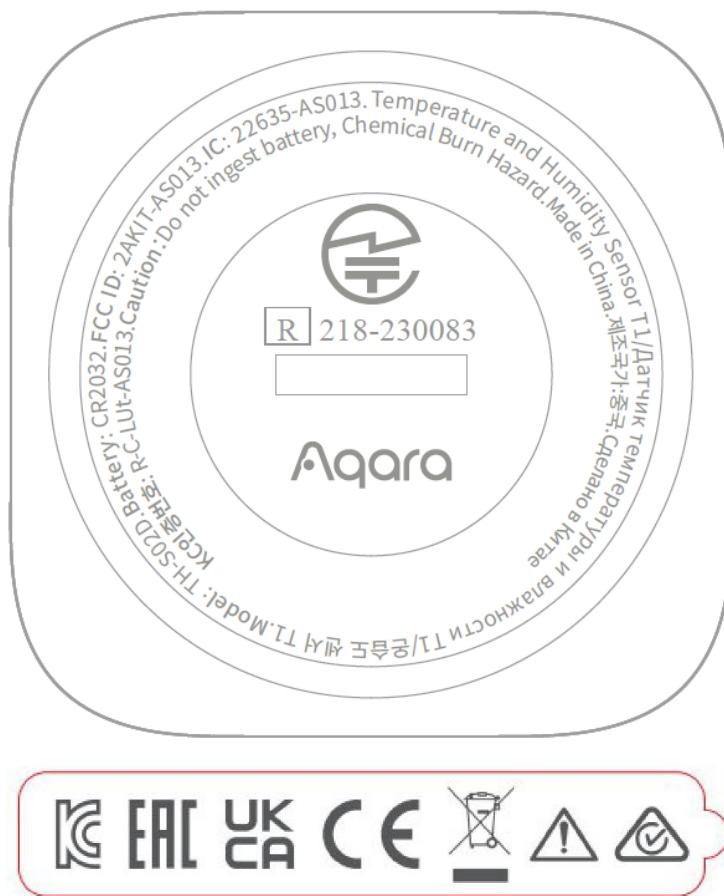
Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

Copy of marking plate(s):

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

**Remark:**

1. The above markings are the minimum requirements required by the safety standard. For the final production, the additional markings which do not give rise to misunderstanding may be added.
2. The CE marking and WEEE symbol should be at least 5.0mm and 7.0mm respectively in height.
3. According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.
4. This is a representative label, the others are identical to it except for the model number.

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



| Test item particulars: | | |
|---|--|--|
| Product group | <input checked="" type="checkbox"/> end product <input type="checkbox"/> built-in component | |
| Classification of use by | <input checked="" type="checkbox"/> Ordinary person <input checked="" type="checkbox"/> Children likely present <input checked="" type="checkbox"/> Instructed person <input checked="" type="checkbox"/> Skilled person | |
| Supply connection | <input type="checkbox"/> AC mains <input type="checkbox"/> DC mains <input checked="" type="checkbox"/> not mains connected: <input checked="" type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3 | |
| Supply tolerance | <input type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> + ____ % / - ____ % <input checked="" type="checkbox"/> None | |
| Supply connection – type | <input type="checkbox"/> pluggable equipment type A – <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> pluggable equipment type B – <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input checked="" type="checkbox"/> other: not Mains connected <input type="checkbox"/> | |
| Considered current rating of protective device | Location: <input type="checkbox"/> building <input type="checkbox"/> equipment <input checked="" type="checkbox"/> N/A, not Mains connected; | |
| Equipment mobility | <input checked="" type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> direct plug-in <input type="checkbox"/> stationary <input type="checkbox"/> for building-in <input checked="" type="checkbox"/> wall/ceiling-mounted <input type="checkbox"/> SRME/rack-mounted <input type="checkbox"/> other: _____ | |
| Overvoltage category (OVC) | <input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input checked="" type="checkbox"/> other: not Mains connected | |
| Class of equipment | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III <input type="checkbox"/> Not classified <input type="checkbox"/> _____ | |
| Special installation location | <input checked="" type="checkbox"/> N/A <input type="checkbox"/> restricted access area <input type="checkbox"/> outdoor location <input type="checkbox"/> _____ | |
| Pollution degree (PD) | <input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3 | |
| Manufacturer's specified T_{ma} | 50°C <input type="checkbox"/> Outdoor: minimum _____ °C | |
| IP protection class | <input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP _____ | |
| Power systems | <input type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - _____ V _{L-L} <input checked="" type="checkbox"/> not AC mains | |
| Altitude during operation (m) | <input type="checkbox"/> 2000 m or less <input checked="" type="checkbox"/> 5000_m | |
| Altitude of test laboratory (m) | <input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> _____ m | |
| Mass of equipment (kg) | 0.015 kg | |

**Possible test case verdicts:**

- test case does not apply to the test object: N/A
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement....: F (Fail)

Testing:

Date of receipt of test item.....: 2025-03-18

Date (s) of performance of tests: 2025-03-24 to 2025-03-26

GENERAL REMARKS:

"(See Enclosure #)" refers to additional information appended to the report.

"(See appended table)" refers to a table appended to the report.

Throughout this report a comma / point is used as the decimal separator.

Name and address of factory (ies).....: /

General product information and other remarks:**Product Description**

1. The product in this report is a Temperature and Humidity Sensor T1, class III equipment used for information technology equipment.
2. The maximum ambient temperature specified by manufacturer is +50°C.

Model Differences

All models are identical to each other except for model name.

Additional application considerations – (Considerations used to test a component or sub-assembly)

N/A

Report version

| Revised No. | Report No. | Date of issue | Description |
|-------------|---------------|---------------|-------------|
| 01 | CTC2025222570 | 2025-03-28 | Original |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

**OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS**

| Clause | Possible Hazard | | | |
|--|--|------------------------|-------------------|-----------------------|
| 5 | Electrically-caused injury | | | |
| Class and Energy Source (e.g. ES3: Primary circuit) | Body Part (e.g. Ordinary) | Safeguards | | |
| | | B | S | R |
| ES1: All internal circuits | Ordinary | N/A | N/A | N/A |
| 6 | Electrically-caused fire | | | |
| Class and Energy Source (e.g. PS2: 100 Watt circuit) | Material part (e.g. Printed board) | Safeguards | | |
| | | B | 1 st S | 2 nd S |
| PS1: <15 Watt circuit (All Internal circuits) | PCB | Comply with Clause 6.3 | N/A | N/A |
| PS1: <15 Watt circuit (All Internal circuits) | Combustible materials within equipment | Comply with Clause 6.3 | N/A | N/A |
| 7 | Injury caused by hazardous substances | | | |
| Class and Energy Source (e.g. Ozone) | Body Part (e.g., Skilled) | Safeguards | | |
| | | B | S | R |
| Button battery | Ordinary | N/A | N/A | Complied with annex M |
| 8 | Mechanically-caused injury | | | |
| Class and Energy Source (e.g. MS3: Plastic fan blades) | Body Part (e.g. Ordinary) | Safeguards | | |
| | | B | S | R |
| MS1: Edges and corners | Ordinary | N/A | N/A | N/A |
| MS1: Mass of the unit | Ordinary | N/A | N/A | N/A |
| MS1: Wall/ceiling or other structure mount (Equipment mass ≤ 1 kg, and mounted ≤ 2 m) | Ordinary | N/A | N/A | N/A |
| 9 | Thermal burn | | | |
| Class and Energy Source (e.g. TS1: Keyboard caps) | Body Part (e.g., Ordinary) | Safeguards | | |
| | | B | S | R |
| TS1: All accessible external surface | Ordinary | N/A | N/A | N/A |
| 10 | Radiation | | | |
| Class and Energy Source (e.g. RS1: PMP sound output) | Body Part (e.g., Ordinary) | Safeguards | | |
| | | B | S | R |
| RS1: LED indicating light | Ordinary | N/A | N/A | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



Supplementary Information:

"B" – Basic Safeguard; "S" – Supplementary Safeguard; "R" – Reinforced Safeguard



CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



ENERGY SOURCE DIAGRAM

Indicate which energy sources are included in the energy source diagram. Insert diagram below

See "OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS" for details.

ES **PS** **MS** **TS** **RS**



CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China
Inspection And Testing Society: yz.cnca.cn



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|----------|---|--|---------|
| 4 | GENERAL REQUIREMENTS | | |
| 4.1.1 | Acceptance of materials, components and subassemblies | (See appended table 4.1.2) | P |
| 4.1.2 | Use of components | Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. See also Annex G | P |
| 4.1.3 | Equipment design and construction | Equipment is adequately designed and constructed. | P |
| 4.1.4 | Specified ambient temperature for outdoor use (°C) | Indoor use only | N/A |
| 4.1.5 | Constructions and components not specifically covered | No such constructions and components. | N/A |
| 4.1.8 | Liquids and liquid filled components (LFC) | No such parts. | N/A |
| 4.1.15 | Markings and instructions | (See Annex F) | P |
| 4.4.3 | Safeguard robustness | See below | P |
| 4.4.3.1 | General | | P |
| 4.4.3.2 | Steady force tests | (See Annex T.5). | P |
| 4.4.3.3 | Drop tests | | N/A |
| 4.4.3.4 | Impact tests | (See Annex T.6) | P |
| 4.4.3.5 | Internal accessible safeguard tests | No such parts. | N/A |
| 4.4.3.6 | Glass impact tests | No such glass used. | N/A |
| 4.4.3.7 | Glass fixation tests | No such parts. | N/A |
| | Glass impact test (1J) | | N/A |
| | Push/pull test (10 N) | | N/A |
| 4.4.3.8 | Thermoplastic material tests | (See Annex T.8) | P |
| 4.4.3.9 | Air comprising a safeguard | No such air comprising a safeguard | N/A |
| 4.4.3.10 | Accessibility, glass, safeguard effectiveness | After test of 4.4.3.2, 4.4.3.4 and 4.4.3.8, no safeguard | P |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|---|---|---------|
| | | damage. | |
| 4.4.4 | Displacement of a safeguard by an insulating liquid | No such liquid. | N/A |
| 4.4.5 | Safety interlocks | No such parts. | N/A |
| 4.5 | Explosion | | P |
| 4.5.1 | General | No explosion occurs during normal/abnormal operation and single fault conditions | P |
| 4.5.2 | No explosion during normal/abnormal operating condition | (See Clause B.2, B.3) | P |
| | No harm by explosion during single fault conditions | (See Clause B.4) | P |
| 4.6 | Fixing of conductors | | N/A |
| | Fix conductors not to defeat a safeguard | | N/A |
| | Compliance is checked by test | | N/A |
| 4.7 | Equipment for direct insertion into mains socket-outlets | | N/A |
| 4.7.2 | Mains plug part complies with relevant standard...: | Not direct plug-in equipment. | N/A |
| 4.7.3 | Torque (Nm).....: | | N/A |
| 4.8 | Equipment containing coin/button cell batteries | | P |
| 4.8.1 | General | | P |
| 4.8.2 | Instructional safeguard | Instructional safeguard accordance with Clause F.5 have provided in user manual. | P |
| 4.8.3 | Battery compartment door/cover construction | A tool such as a coin is required to open the battery compartment. Additionally, a minimum torque of 0.5 Nm and minimum angle of 90 degrees of rotation is required to open the internal battery compartment cover. | P |
| | Open torque test | | P |
| 4.8.4.2 | Stress relief test | | P |
| 4.8.4.3 | Battery replacement test | | P |
| 4.8.4.4 | Drop test | | N/A |
| 4.8.4.5 | Impact test | | P |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

| IEC 62368-1 | | | |
|-------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.8.4.6 | Crush test | | N/A |
| 4.8.5 | Compliance | After test, the battery compartment door remain functional and the battery not become accessible. | P |
| | 30N force test with test probe | | P |
| | 20N force test with test hook | | P |
| 4.9 | Likelihood of fire or shock due to entry of conductive object | | P |
| 4.10 | Component requirements | | N/A |
| 4.10.1 | Disconnect Device | | N/A |
| 4.10.2 | Switches and relays | | N/A |
| 5 | ELECTRICALLY-CAUSED INJURY | | P |
| 5.2 | Classification and limits of electrical energy sources | | P |
| 5.2.2 | ES1, ES2 and ES3 limits | | P |
| 5.2.2.2 | Steady-state voltage and current limits | (See appended table 5.2) | P |
| 5.2.2.3 | Capacitance limits | | N/A |
| 5.2.2.4 | Single pulse limits..... | | N/A |
| 5.2.2.5 | Limits for repetitive pulses | | N/A |
| 5.2.2.6 | Ringing signals | | N/A |
| 5.2.2.7 | Audio signals | | N/A |
| 5.3 | Protection against electrical energy sources | | N/A |
| 5.3.1 | General Requirements for accessible parts to ordinary, instructed and skilled persons | | N/A |
| 5.3.1 a) | Accessible ES1/ES2 derived from ES2/ES3 circuits | | N/A |
| 5.3.1 b) | Skilled persons not unintentional contact ES3 bare conductors | | N/A |
| 5.3.2.1 | Accessibility to electrical energy sources and safeguards | Only ES1 circuit can be accessed for this product | N/A |
| | Accessibility to outdoor equipment bare parts | | N/A |
| 5.3.2.2 | Contact requirements | | N/A |
| | Test with test probe from Annex V | | - |
| 5.3.2.2 a) | Air gap – electric strength test potential (V) | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-------------|---|-----------------|---------|
| 5.3.2.2 b) | Air gap – distance (mm) | | N/A |
| 5.3.2.3 | Compliance | | N/A |
| 5.3.2.4 | Terminals for connecting stripped wire | | N/A |
| 5.4 | Insulation materials and requirements | | N/A |
| 5.4.1.2 | Properties of insulating material | | N/A |
| 5.4.1.3 | Material is non-hygroscopic | | N/A |
| 5.4.1.4 | Maximum operating temperature for insulating materials | | N/A |
| 5.4.1.5 | Pollution degrees.....: | | N/A |
| 5.4.1.5.2 | Test for pollution degree 1 environment and for an insulating compound | | N/A |
| 5.4.1.5.3 | Thermal cycling test | | N/A |
| 5.4.1.6 | Insulation in transformers with varying dimensions | | N/A |
| 5.4.1.7 | Insulation in circuits generating starting pulses | | N/A |
| 5.4.1.8 | Determination of working voltage | | N/A |
| 5.4.1.9 | Insulating surfaces | | N/A |
| 5.4.1.10 | Thermoplastic parts on which conductive metallic parts are directly mounted | | N/A |
| 5.4.1.10.2 | Vicat test.....: | | N/A |
| 5.4.1.10.3 | Ball pressure test.....: | | N/A |
| 5.4.2 | Clearances | | N/A |
| 5.4.2.1 | General requirements | | N/A |
| | Clearances in circuits connected to AC Mains, Alternative method | | N/A |
| 5.4.2.2 | Procedure 1 for determining clearance | | N/A |
| | Temporary overvoltage | | — |
| 5.4.2.3 | Procedure 2 for determining clearance | | N/A |
| 5.4.2.3.2.2 | a.c. mains transient voltage | | — |
| 5.4.2.3.2.3 | d.c. mains transient voltage | | — |
| 5.4.2.3.2.4 | External circuit transient voltage.....: | | — |
| 5.4.2.3.2.5 | Transient voltage determined by measurement | | — |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------|---|-----------------|---------|
| 5.4.2.4 | Determining the adequacy of a clearance using an electric strength test | | N/A |
| 5.4.2.5 | Multiplication factors for clearances and test voltages | | N/A |
| 5.4.2.6 | Clearance measurement | | N/A |
| 5.4.3 | Creepage distances | | N/A |
| 5.4.3.1 | General | | N/A |
| 5.4.3.3 | Material group | | — |
| 5.4.3.4 | Creepage distances measurement | | N/A |
| 5.4.4 | Solid insulation | | N/A |
| 5.4.4.1 | General requirements | | N/A |
| 5.4.4.2 | Minimum distance through insulation | | N/A |
| 5.4.4.3 | Insulating compound forming solid insulation | | N/A |
| 5.4.4.4 | Solid insulation in semiconductor devices | | N/A |
| 5.4.4.5 | Insulating compound forming cemented joints | | N/A |
| 5.4.4.6 | Thin sheet material | | N/A |
| 5.4.4.6.1 | General requirements | | N/A |
| 5.4.4.6.2 | Separable thin sheet material | | N/A |
| | Number of layers (pcs) | | N/A |
| 5.4.4.6.3 | Non-separable thin sheet material | | N/A |
| | Number of layers (pcs) | | N/A |
| 5.4.4.6.4 | Standard test procedure for non-separable thin sheet material | | N/A |
| 5.4.4.6.5 | Mandrel test | | N/A |
| 5.4.4.7 | Solid insulation in wound components | | N/A |
| 5.4.4.9 | Solid insulation at frequencies >30 kHz, EP, KR, d, VPW (V) | | N/A |
| | Alternative by electric strength test, tested voltage (V), KR | | N/A |
| 5.4.5 | Antenna terminal insulation | | N/A |
| 5.4.5.1 | General | | N/A |
| 5.4.5.2 | Voltage surge test | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|--|-----------------|---------|
| 5.4.5.3 | Insulation resistance ($M\Omega$) | | N/A |
| | Electric strength test.....: | | N/A |
| 5.4.6 | Insulation of internal wire as part of supplementary safeguard | | N/A |
| 5.4.7 | Tests for semiconductor components and for cemented joints | | N/A |
| 5.4.8 | Humidity conditioning | | N/A |
| | Relative humidity (%), temperature (°C), duration (h).....: | | — |
| 5.4.9 | Electric strength test | | N/A |
| 5.4.9.1 | Test procedure for type test of solid insulation.....: | | N/A |
| 5.4.9.2 | Test procedure for routine test | | N/A |
| 5.4.10 | Safeguards against transient voltages from external circuits | | N/A |
| 5.4.10.1 | Parts and circuits separated from external circuits | | N/A |
| 5.4.10.2 | Test methods | | N/A |
| 5.4.10.2.1 | General | | N/A |
| 5.4.10.2.2 | Impulse test.....: | | N/A |
| 5.4.10.2.3 | Steady-state test.....: | | N/A |
| 5.4.10.3 | Verification for insulation breakdown for impulse test | | N/A |
| 5.4.11 | Separation between external circuits and earth | | N/A |
| 5.4.11.1 | Exceptions to separation between external circuits and earth | | N/A |
| 5.4.11.2 | Requirements | | N/A |
| | SPDs bridge separation between external circuit and earth | | N/A |
| | Rated operating voltage U_{op} (V) | | — |
| | Nominal voltage U_{peak} (V) | | — |
| | Max increase due to variation ΔU_{sp} | | — |
| | Max increase due to ageing ΔU_{sa} | | — |
| 5.4.11.3 | Test method and compliance.....: | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|---|-----------------------------------|---------|
| 5.4.12 | Insulating liquid | | N/A |
| 5.4.12.1 | General requirements | | N/A |
| 5.4.12.2 | Electric strength of an insulating liquid | | N/A |
| 5.4.12.3 | Compatibility of an insulating liquid..... | | N/A |
| 5.4.12.4 | Container for insulating liquid | | N/A |
| 5.5 | Components as safeguards | | N/A |
| 5.5.1 | General | No such components as safeguards. | N/A |
| 5.5.2 | Capacitors and RC units | | N/A |
| 5.5.2.1 | General requirement | | N/A |
| 5.5.2.2 | Safeguards against capacitor discharge after disconnection of a connector | | N/A |
| 5.5.3 | Transformers | | N/A |
| 5.5.4 | Optocouplers | | N/A |
| 5.5.5 | Relays | | N/A |
| 5.5.6 | Resistors | | N/A |
| 5.5.7 | SPDs | | N/A |
| 5.5.8 | Insulation between the mains and an external circuit consisting of a coaxial cable..... | | N/A |
| 5.5.9 | Safeguards for socket-outlets in outdoor equipment | | N/A |
| | RCD rated residual operating current (mA) | — | — |
| 5.6 | Protective conductor | | N/A |
| 5.6.2 | Requirement for protective conductors | | N/A |
| 5.6.2.1 | General requirements | Class III equipment | N/A |
| 5.6.2.2 | Colour of insulation | | N/A |
| 5.6.3 | Requirement for protective earthing conductors | | N/A |
| | Protective earthing conductor size (mm ²) | — | — |
| | Protective earthing conductor serving as a reinforced safeguard | | N/A |
| | Protective earthing conductor serving as a double safeguard | | N/A |
| 5.6.4 | Requirements for protective bonding conductors | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|---------|--|-----------------|---------|
| 5.6.4.1 | Protective bonding conductors | | N/A |
| | Protective bonding conductor size (mm ²). : | | — |
| 5.6.4.2 | Protective current rating (A)..... : | | N/A |
| 5.6.5 | Terminals for protective conductors | | N/A |
| 5.6.5.1 | Terminal size for connecting protective earthing conductors (mm) : | | N/A |
| | Terminal size for connecting protective bonding conductors (mm) : | | N/A |
| 5.6.5.2 | Corrosion | | N/A |
| 5.6.6 | Resistance of the protective bonding system | | N/A |
| 5.6.6.1 | Requirements | | N/A |
| 5.6.6.2 | Test Method : | | N/A |
| 5.6.6.3 | Resistance (Ω) or voltage drop..... : | | N/A |
| 5.6.7 | Reliable connection of a protective earthing conductor | | N/A |
| 5.6.8 | Functional earthing | | N/A |
| | Conductor size (mm ²) : | | N/A |
| | Class II with functional earthing marking : | | N/A |
| | Appliance inlet cl & cr (mm) : | | N/A |
| 5.7 | Prospective touch voltage, touch current and protective conductor current | | N/A |
| 5.7.2 | Measuring devices and networks | | N/A |
| 5.7.2.1 | Measurement of touch current | | N/A |
| 5.7.2.2 | Measurement of voltage | | N/A |
| 5.7.3 | Equipment set-up, supply connections and earth connections | | N/A |
| 5.7.4 | Unearthed accessible parts : | | N/A |
| 5.7.5 | Earthed accessible conductive parts : | | N/A |
| 5.7.6 | Requirements when touch current exceeds ES2 limits | | N/A |
| | Protective conductor current (mA) : | | N/A |
| | Instructional Safeguard..... : | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

| IEC 62368-1 | | | |
|-------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.7.7 | Prospective touch voltage and touch current associated with external circuits | | N/A |
| 5.7.7.1 | Touch current from coaxial cables | | N/A |
| 5.7.7.2 | Prospective touch voltage and touch current associated with paired conductor cables | | N/A |
| 5.7.8 | Summation of touch currents from external circuits | | N/A |
| | a) Equipment connected to earthed external circuits, current (mA).....: | | N/A |
| | b) Equipment connected to unearthing external circuits, current (mA).....: | | N/A |
| 5.8 | Backfeed safeguard in battery backed up supplies | | N/A |
| | Mains terminal ES | | N/A |
| | Air gap (mm).....: | | N/A |

| | | | |
|------------|--|--|----------------------------|
| 6 | ELECTRICALLY- CAUSED FIRE | | P |
| 6.2 | Classification of PS and PIS | | P |
| 6.2.2 | Power source circuit classifications | PS (power source) classification determined by measuring the maximum power in Figures 34 and 35 for load and power source circuits. (See appended table 6.2.2) | P |
| 6.2.3 | Classification of potential ignition sources | | See the following details. |
| 6.2.3.1 | Arcing PIS | No Arcing PIS exist in the equipment | N/A |
| 6.2.3.2 | Resistive PIS | (See appended table 6.2.3.2) | P |
| 6.3 | Safeguards against fire under normal operating and abnormal operating conditions | | P |
| 6.3.1 | No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials.....: | No ignition and no such temperature attained within the equipment. (See appended table B.1.5 & B.3) | P |
| | Combustible materials outside fire enclosure.....: | | P |
| 6.4 | Safeguards against fire under single fault conditions | | P |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------|---|--|---------|
| 6.4.1 | Safeguard method | Method by control of fire spread applied | P |
| 6.4.2 | Reduction of the likelihood of ignition under single fault conditions in PS1 circuits | | N/A |
| 6.4.3 | Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits | | N/A |
| 6.4.3.1 | Supplementary safeguards | | N/A |
| 6.4.3.2 | Single Fault Conditions | | N/A |
| | Special conditions for temperature limited by fuse | | N/A |
| 6.4.4 | Control of fire spread in PS1 circuits | No supplementary safeguards are needed for protection against PS1. | N/A |
| 6.4.5 | Control of fire spread in PS2 circuits | Only PS1 circuits within the equipment | N/A |
| 6.4.5.2 | Supplementary safeguards | | N/A |
| 6.4.6 | Control of fire spread in PS3 circuits | | N/A |
| 6.4.7 | Separation of combustible materials from a PIS | | N/A |
| 6.4.7.2 | Separation by distance | | N/A |
| 6.4.7.3 | Separation by a fire barrier | | N/A |
| 6.4.8 | Fire enclosures and fire barriers | | N/A |
| 6.4.8.2 | Fire enclosure and fire barrier material properties | | N/A |
| 6.4.8.2.1 | Requirements for a fire barrier | | N/A |
| 6.4.8.2.2 | Requirements for a fire enclosure | | N/A |
| 6.4.8.3 | Constructional requirements for a fire enclosure and a fire barrier | | N/A |
| 6.4.8.3.1 | Fire enclosure and fire barrier openings | | N/A |
| 6.4.8.3.2 | Fire barrier dimensions | | N/A |
| 6.4.8.3.3 | Top openings and properties | | N/A |
| | Openings dimensions (mm) | | N/A |
| 6.4.8.3.4 | Bottom openings and properties | | N/A |
| | Openings dimensions (mm) | | N/A |
| | Flammability tests for the bottom of a fire enclosure | | N/A |
| | Instructional Safeguard | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|---|-----------------|---------|
| 6.4.8.3.5 | Side openings and properties | | N/A |
| | Openings dimensions (mm) | | N/A |
| 6.4.8.3.6 | Integrity of a fire enclosure, condition met: a), b) or c) | | N/A |
| 6.4.8.4 | Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating | | N/A |
| 6.4.9 | Flammability of insulating liquid | | N/A |
| 6.5 | Internal and external wiring | | N/A |
| 6.5.1 | General requirements | | N/A |
| 6.5.2 | Requirements for interconnection to building wiring | | N/A |
| 6.5.3 | Internal wiring size (mm ²) for socket-outlets | | N/A |
| 6.6 | Safeguards against fire due to the connection to additional equipment | | N/A |

| | | |
|----------|---|-----|
| 7 | INJURY CAUSED BY HAZARDOUS SUBSTANCES | P |
| 7.2 | Reduction of exposure to hazardous substances | N/A |
| 7.3 | Ozone exposure | N/A |
| 7.4 | Use of personal safeguards or personal protective equipment (PPE) | N/A |
| | Personal safeguards and instructions | — |
| 7.5 | Use of instructional safeguards and instructions | N/A |
| | Instructional safeguard (ISO 7010) | — |
| 7.6 | Batteries and their protection circuits | P |

| | | |
|----------|---|---|
| 8 | MECHANICALLY-CAUSED INJURY | P |
| 8.2 | Mechanical energy source classifications | P |
| 8.3 | Safeguards against mechanical energy sources | P |
| 8.4 | Safeguards against parts with sharp edges and corners | P |
| 8.4.1 | Safeguards | MS1: Edges and corners of enclosure |
| | Instructional Safeguard | N/A |
| 8.4.2 | Sharp edges or corners | Edges and corners of the enclosure are rounded. |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--|---|------------------------------|---------|
| 8.5 Safeguards against moving parts | | | N/A |
| 8.5.1 | Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts | No moving parts. | N/A |
| | MS2 or MS3 part required to be accessible for the function of the equipment | | N/A |
| | Moving MS3 parts only accessible to skilled person | | N/A |
| 8.5.2 | Instructional safeguard.....: | | N/A |
| 8.5.4 | Special categories of equipment containing moving parts | | N/A |
| 8.5.4.1 | General | | N/A |
| 8.5.4.2 | Equipment containing work cells with MS3 parts | | N/A |
| 8.5.4.2.1 | Protection of persons in the work cell | | N/A |
| 8.5.4.2.2 | Access protection override | | N/A |
| 8.5.4.2.2.1 | Override system | | N/A |
| 8.5.4.2.2.2 | Visual indicator | | N/A |
| 8.5.4.2.3 | Emergency stop system | | N/A |
| | Maximum stopping distance from the point of activation (m) | | N/A |
| | Space between end point and nearest fixed mechanical part (mm) | | N/A |
| 8.5.4.2.4 | Endurance requirements | | N/A |
| | Mechanical system subjected to 100 000 cycles of operation | | N/A |
| | - Mechanical function check and visual inspection | | N/A |
| | - Cable assembly.....: | | N/A |
| 8.5.4.3 | Equipment having electromechanical device for destruction of media | | N/A |
| 8.5.4.3.1 | Equipment safeguards | | N/A |
| 8.5.4.3.2 | Instructional safeguards against moving parts.....: | | N/A |
| 8.5.4.3.3 | Disconnection from the supply | | N/A |
| 8.5.4.3.4 | Cut type and test force (N).....: | | N/A |
| 8.5.4.3.5 | Compliance | | N/A |
| 8.5.5 | High pressure lamps | No high pressure lamps used. | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-------------|--|--|---------|
| | Explosion test | | N/A |
| 8.5.5.3 | Glass particles dimensions (mm) | | N/A |
| 8.6 | Stability of equipment | | N/A |
| 8.6.1 | General | MS1: Mass of the unit | N/A |
| | Instructional safeguard..... | | N/A |
| 8.6.2 | Static stability | | N/A |
| 8.6.2.2 | Static stability test..... | | N/A |
| 8.6.2.3 | Downward force test | | N/A |
| 8.6.3 | Relocation stability | | N/A |
| | Wheels diameter (mm)..... | | — |
| | Tilt test | | N/A |
| 8.6.4 | Glass slide test | | N/A |
| 8.6.5 | Horizontal force test | | N/A |
| 8.7 | Equipment mounted to wall, ceiling or other structure | | N/A |
| 8.7.1 | Mount means type..... | Equipment mass \leq 1 kg, and mounted \leq 2 m, classified as MS1. | N/A |
| 8.7.2 | Test methods | | N/A |
| | Test 1, additional downwards force (N)..... | | N/A |
| | Test 2, number of attachment points and test force (N) | | N/A |
| | Test 3 Nominal diameter (mm) and applied torque (Nm) | | N/A |
| 8.8 | Handles strength | | N/A |
| 8.8.1 | General | No handles | N/A |
| 8.8.2 | Handle strength test | | N/A |
| | Number of handles..... | | — |
| | Force applied (N)..... | | — |
| 8.9 | Wheels or casters attachment requirements | | N/A |
| 8.9.2 | Pull test | No such parts | N/A |
| 8.10 | Carts, stands and similar carriers | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-------------|---|--------------------------------------|---------|
| 8.10.1 | General | No carts, stands or similar carriers | N/A |
| 8.10.2 | Marking and instructions | | N/A |
| 8.10.3 | Cart, stand or carrier loading test | | N/A |
| | Loading force applied (N).....: | | N/A |
| 8.10.4 | Cart, stand or carrier impact test | | N/A |
| 8.10.5 | Mechanical stability | | N/A |
| | Force applied (N).....: | | — |
| 8.10.6 | Thermoplastic temperature stability | | N/A |
| 8.11 | Mounting means for slide-rail mounted equipment (SRME) | | N/A |
| 8.11.1 | General | No such parts | N/A |
| 8.11.2 | Requirements for slide rails | | N/A |
| | Instructional Safeguard | | N/A |
| 8.11.3 | Mechanical strength test | | N/A |
| 8.11.3.1 | Downward force test, force (N) applied.....: | | N/A |
| 8.11.3.2 | Lateral push force test | | N/A |
| 8.11.3.3 | Integrity of slide rail end stops | | N/A |
| 8.11.4 | Compliance | | N/A |
| 8.12 | Telescoping or rod antennas | | N/A |
| | Button/ball diameter (mm).....: | No such parts | — |

| | | |
|------------|--|---|
| 9 | THERMAL BURN INJURY | P |
| 9.2 | Thermal energy source classifications | P |
| 9.3 | Touch temperature limits | P |
| 9.3.1 | Touch temperatures of accessible parts | (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6) |
| 9.3.2 | Test method and compliance | P |
| 9.4 | Safeguards against thermal energy sources | P |
| 9.5 | Requirements for safeguards | N/A |
| 9.5.1 | Equipment safeguard | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|---|--|---------|
| 9.5.2 | Instructional safeguard.....: | Instructional safeguard is not required. | N/A |
| 9.6 | Requirements for wireless power transmitters | | N/A |
| 9.6.1 | General | No wireless power transmitters | N/A |
| 9.6.2 | Specification of the foreign objects | | N/A |
| 9.6.3 | Test method and compliance | | N/A |

| | | | |
|-------------|---|---|-----|
| 10 | RADIATION | | P |
| 10.2 | Radiation energy source classification | | P |
| 10.2.1 | General classification | See below | P |
| | Lasers | | — |
| | Lamps and lamp systems | RS1: The LED indicating light only used for indicating, which is considered as low power & inherently exempt group according to IEC 62471 | — |
| | Image projectors | | — |
| | X-Ray | | — |
| | Personal music player..... | | — |
| 10.3 | Safeguards against laser radiation | | N/A |
| | The standard(s) equipment containing laser(s) comply | No laser radiation | N/A |
| 10.4 | Safeguards against optical radiation from lamps and lamp systems (including LED types) | | P |
| 10.4.1 | General requirements | LED indicating light: Classed as RS1 | P |
| | Instructional safeguard provided for accessible radiation level needs to exceed | | N/A |
| | Risk group marking and location | | N/A |
| | Information for safe operation and installation | | N/A |
| 10.4.2 | Requirements for enclosures | | N/A |
| | UV radiation exposure..... | | N/A |
| 10.4.3 | Instructional safeguard..... | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
|--------|--------------------|-----------------|---------|

| | | | |
|-------------|--|-------------------|-----|
| 10.5 | Safeguards against X-radiation | | N/A |
| 10.5.1 | Requirements | No X-radiation | N/A |
| | Instructional safeguard for skilled persons | | — |
| 10.5.3 | Maximum radiation (pA/kg) | | — |
| 10.6 | Safeguards against acoustic energy sources | | N/A |
| 10.6.1 | General | No such equipment | N/A |
| 10.6.2 | Classification | | N/A |
| | Acoustic output $L_{Aeq,T}$, dB(A) | | N/A |
| | Unweighted RMS output voltage (mV) | | N/A |
| | Digital output signal (dBFS) | | N/A |
| 10.6.3 | Requirements for dose-based systems | | N/A |
| 10.6.3.1 | General requirements | | N/A |
| 10.6.3.2 | Dose-based warning and automatic decrease | | N/A |
| 10.6.3.3 | Exposure-based warning and requirements | | N/A |
| | 30 s integrated exposure level (MEL30).....: | | N/A |
| | Warning for $MEL \geq 100$ dB(A).....: | | N/A |
| 10.6.4 | Measurement methods | | N/A |
| 10.6.5 | Protection of persons | | N/A |
| | Instructional safeguards.....: | | N/A |
| 10.6.6 | Requirements for listening devices (headphones, earphones, etc.) | | N/A |
| 10.6.6.1 | Corded listening devices with analogue input | | N/A |
| | Listening device input voltage (mV) | | N/A |
| 10.6.6.2 | Corded listening devices with digital input | | N/A |
| | Max. acoustic output $L_{Aeq,T}$, dB(A) | | N/A |
| 10.6.6.3 | Cordless listening devices | | N/A |
| | Max. acoustic output $L_{Aeq,T}$, dB(A) | | N/A |

| | | |
|------------|--|---|
| B | NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS | P |
| B.1 | General | P |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|--|--|---------|
| B.1.5 | Temperature measurement conditions | (See appended table B.1.5) | P |
| B.2 | Normal operating conditions | | P |
| B.2.1 | General requirements | (See Test Item Particulars and appended test tables) | P |
| | Audio Amplifiers and equipment with audio amplifiers | | N/A |
| B.2.3 | Supply voltage and tolerances | (See appended table B.2.5) | P |
| B.2.5 | Input test | (See appended table B.2.5) | P |
| B.3 | Simulated abnormal operating conditions | | P |
| B.3.1 | General | | P |
| B.3.2 | Covering of ventilation openings | | N/A |
| | Instructional safeguard.....: | | N/A |
| B.3.3 | DC mains polarity test | | N/A |
| B.3.4 | Setting of voltage selector | | N/A |
| B.3.5 | Maximum load at output terminals | | N/A |
| B.3.6 | Reverse battery polarity | (See appended table B.3 & B.4) | P |
| B.3.7 | Audio amplifier abnormal operating conditions | | N/A |
| B.3.8 | Safeguards functional during and after abnormal operating conditions | | P |
| B.4 | Simulated single fault conditions | | P |
| B.4.1 | General | | P |
| B.4.2 | Temperature controlling device | | N/A |
| B.4.3 | Blocked motor test | No motors used. | N/A |
| B.4.4 | Functional insulation | | N/A |
| B.4.4.1 | Short circuit of clearances for functional insulation | | N/A |
| B.4.4.2 | Short circuit of creepage distances for functional insulation | | N/A |
| B.4.4.3 | Short circuit of functional insulation on coated printed boards | | N/A |
| B.4.5 | Short-circuit and interruption of electrodes in tubes and semiconductors | (See appended table B.3 & B.4) | P |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|--|---|---------|
| B.4.6 | Short circuit or disconnection of passive components | (See appended table B.3 & B.4) | P |
| B.4.7 | Continuous operation of components | The EUT is continuous operating type and no such components intended for short time operation or intermittent operation | N/A |
| B.4.8 | Compliance during and after single fault conditions | No change to circuits classified in 5.3 | P |
| B.4.9 | Battery charging and discharging under single fault conditions | Battery complied with Annex M | P |
| C | UV RADIATION | | N/A |
| C.1 | Protection of materials in equipment from UV radiation | | N/A |
| C.1.2 | Requirements | No such UV generated from the equipment. | N/A |
| C.1.3 | Test method | | N/A |
| C.2 | UV light conditioning test | | N/A |
| C.2.1 | Test apparatus | | N/A |
| C.2.2 | Mounting of test samples | | N/A |
| C.2.3 | Carbon-arc light-exposure test | | N/A |
| C.2.4 | Xenon-arc light-exposure test | | N/A |
| D | TEST GENERATORS | | N/A |
| D.1 | Impulse test generators | | N/A |
| D.2 | Antenna interface test generator | | N/A |
| D.3 | Electronic pulse generator | | N/A |
| E | TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS | | N/A |
| E.1 | Electrical energy source classification for audio signals | | N/A |
| | Maximum non-clipped output power (W) | | — |
| | Rated load impedance (Ω) | | — |
| | Open-circuit output voltage (V) | | — |
| | Instructional safeguard..... | | — |
| E.2 | Audio amplifier normal operating conditions | | N/A |
| | Audio signal source type | | — |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|---------|---|--|---------|
| | Audio output power (W) | | — |
| | Audio output voltage (V)..... | | — |
| | Rated load impedance (Ω) | | — |
| | Requirements for temperature measurement | | N/A |
| E.3 | Audio amplifier abnormal operating conditions | | N/A |
| F | EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS | | P |
| F.1 | General | | P |
| | Language | English | — |
| F.2 | Letter symbols and graphical symbols | | P |
| F.2.1 | Letter symbols according to IEC60027-1 | Letter symbols for quantities and units are complied with IEC 60027-1. | P |
| F.2.2 | Graphic symbols according to IEC, ISO or manufacturer specific | Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010. | P |
| F.3 | Equipment markings | | P |
| F.3.1 | Equipment marking locations | The required marking is located on the enclosure of the equipment and is easily visible. | P |
| F.3.2 | Equipment identification markings | See below for details. | P |
| F.3.2.1 | Manufacturer identification | See copy of marking plate | P |
| F.3.2.2 | Model identification | See copy of marking plate | P |
| F.3.3 | Equipment rating markings | See below for details. | P |
| F.3.3.1 | Equipment with direct connection to mains | | N/A |
| F.3.3.2 | Equipment without direct connection to mains | | P |
| F.3.3.3 | Nature of the supply voltage | | N/A |
| F.3.3.4 | Rated voltage | | N/A |
| F.3.3.5 | Rated frequency | | N/A |
| F.3.3.6 | Rated current or rated power | | N/A |
| F.3.3.7 | Equipment with multiple supply connections | Single supply connection. | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------|--|--|---------|
| F.3.4 | Voltage setting device | No voltage setting device. | N/A |
| F.3.5 | Terminals and operating devices | | N/A |
| F.3.5.1 | Mains appliance outlet and socket-outlet markings | No mains appliance outlet or socket-outlet provided. | N/A |
| F.3.5.2 | Switch position identification marking | | N/A |
| F.3.5.3 | Replacement fuse identification and rating markings..... | | N/A |
| | Instructional safeguards for neutral fuse | | N/A |
| F.3.5.4 | Replacement battery identification marking | (See Clause M.10) | P |
| F.3.5.5 | Neutral conductor terminal | | N/A |
| F.3.5.6 | Terminal marking location | | N/A |
| F.3.6 | Equipment markings related to equipment classification | Class III equipment | N/A |
| F.3.6.1 | Class I equipment | | N/A |
| F.3.6.1.1 | Protective earthing conductor terminal | | N/A |
| F.3.6.1.2 | Protective bonding conductor terminals | | N/A |
| F.3.6.2 | Equipment class marking | | N/A |
| F.3.6.3 | Functional earthing terminal marking..... | | N/A |
| F.3.7 | Equipment IP rating marking..... | This equipment is classified as IPX0. | — |
| F.3.8 | External power supply output marking..... | | N/A |
| F.3.9 | Durability, legibility and permanence of marking | Marking is considered to be legible and easily discernible. See also the following details. | P |
| F.3.10 | Test for permanence of markings | The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. And then again for 15 sec, with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling and lifting of the label edge. After each test, the marking remained legible. | P |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|--|--------------------------------------|---------|
| F.4 | Instructions | | |
| | a) Information prior to installation and initial use | Provided in the manual. | P |
| | b) Equipment for use in locations where children not likely to be present | Not such equipment | N/A |
| | c) Instructions for installation and interconnection | Not such equipment | N/A |
| | d) Equipment intended for use only in restricted access area | Not such equipment | N/A |
| | e) Equipment intended to be fastened in place | Not such equipment | N/A |
| | f) Instructions for audio equipment terminals | No such terminals provided. | N/A |
| | g) Protective earthing used as a safeguard | Class III equipment | N/A |
| | h) Protective conductor current exceeding ES2 limits | Class III equipment | N/A |
| | i) Graphic symbols used on equipment | | N/A |
| | j) Permanently connected equipment not provided with all-pole mains switch | Not permanently connected equipment. | N/A |
| | k) Replaceable components or modules providing safeguard function | No such markings. | N/A |
| | l) Equipment containing insulating liquid | No such liquid. | N/A |
| | m) Installation instructions for outdoor equipment | Not such equipment | N/A |
| F.5 | Instructional safeguards | | |
| G | COMPONENTS | | |
| G.1 | Switches | | |
| G.1.1 | General | No such switches | N/A |
| G.1.2 | Ratings, endurance, spacing, maximum load | | N/A |
| G.1.3 | Test method and compliance | | N/A |
| G.2 | Relays | | |
| G.2.1 | Requirements | No relay used. | N/A |
| G.2.2 | Overload test | | N/A |
| G.2.3 | Relay controlling connectors supplying power to other equipment | | N/A |
| G.2.4 | Test method and compliance | | N/A |
| G.3 | Protective devices | | |
| G.3.1 | Thermal cut-offs | No such component | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|--|-------------------|---------|
| | Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b) | | N/A |
| | Thermal cut-outs tested as part of the equipment as indicated in c) | | N/A |
| G.3.1.2 | Test method and compliance | | N/A |
| G.3.2 | Thermal links | | N/A |
| G.3.2.1 | a) Thermal links tested separately according to IEC 60691 with specifics | | N/A |
| | b) Thermal links tested as part of the equipment | | N/A |
| G.3.2.2 | Test method and compliance | | N/A |
| G.3.3 | PTC thermistors | | N/A |
| G.3.4 | Overcurrent protection devices | | N/A |
| G.3.5 | Safeguards components not mentioned in G.3.1 to G.3.4 | | N/A |
| G.3.5.1 | Non-resettable devices suitably rated and marking provided | | N/A |
| G.3.5.2 | Single faults conditions | | N/A |
| G.4 | Connectors | | N/A |
| G.4.1 | Spacings | No such component | N/A |
| G.4.2 | Mains connector configuration | | N/A |
| G.4.3 | Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely | | N/A |
| G.5 | Wound components | | N/A |
| G.5.1 | Wire insulation in wound components | No such component | N/A |
| G.5.1.2 | Protection against mechanical stress | | N/A |
| G.5.2 | Endurance test | | N/A |
| G.5.2.1 | General test requirements | | N/A |
| G.5.2.2 | Heat run test | | N/A |
| | Test time (days per cycle) | | — |
| | Test temperature (°C) | | — |
| G.5.2.3 | Wound components supplied from the mains | | N/A |
| G.5.2.4 | No insulation breakdown | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------|--|-----------------|---------|
| G.5.3 | Transformers | | N/A |
| G.5.3.1 | Compliance method | | N/A |
| | Position.....:. | | N/A |
| | Method of protection | | N/A |
| G.5.3.2 | Insulation | | N/A |
| | Protection from displacement of windings | | — |
| G.5.3.3 | Transformer overload tests | | N/A |
| G.5.3.3.1 | Test conditions | | N/A |
| G.5.3.3.2 | Winding temperatures | | N/A |
| G.5.3.3.3 | Winding temperatures – alternative test method | | N/A |
| G.5.3.4 | Transformers using FIW | | N/A |
| G.5.3.4.1 | General | | N/A |
| | FIW wire nominal diameter | | — |
| G.5.3.4.2 | Transformers with basic insulation only | | N/A |
| G.5.3.4.3 | Transformers with double insulation or reinforced insulation | | N/A |
| G.5.3.4.4 | Transformers with FIW wound on metal or ferrite core | | N/A |
| G.5.3.4.5 | Thermal cycling test and compliance | | N/A |
| G.5.3.4.6 | Partial discharge test | | N/A |
| G.5.3.4.7 | Routine test | | N/A |
| G.5.4 | Motors | | N/A |
| G.5.4.1 | General requirements | | N/A |
| G.5.4.2 | Motor overload test conditions | | N/A |
| G.5.4.3 | Running overload test | | N/A |
| G.5.4.4.2 | Locked-rotor overload test | | N/A |
| | Test duration (days) | | — |
| G.5.4.5 | Running overload test for DC motors | | N/A |
| G.5.4.5.2 | Tested in the unit | | N/A |
| G.5.4.5.3 | Alternative method | | N/A |
| G.5.4.6 | Locked-rotor overload test for DC motors | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|---|-------------------|---------|
| G.5.4.6.2 | Tested in the unit | | N/A |
| | Maximum Temperature | | N/A |
| G.5.4.6.3 | Alternative method | | N/A |
| G.5.4.7 | Motors with capacitors | | N/A |
| G.5.4.8 | Three-phase motors | | N/A |
| G.5.4.9 | Series motors | | N/A |
| | Operating voltage | | — |
| G.6 | Wire Insulation | | N/A |
| G.6.1 | General | | N/A |
| G.6.2 | Enamelled winding wire insulation | | N/A |
| G.7 | Mains supply cords | | N/A |
| G.7.1 | General requirements | No such component | N/A |
| | Type | | — |
| G.7.2 | Cross sectional area (mm ² or AWG)..... | | N/A |
| G.7.3 | Cord anchorages and strain relief for non-detachable power supply cords | | N/A |
| G.7.3.2 | Cord strain relief | | N/A |
| G.7.3.2.1 | Requirements | | N/A |
| | Strain relief test force (N) | | N/A |
| G.7.3.2.2 | Strain relief mechanism failure | | N/A |
| G.7.3.2.3 | Cord sheath or jacket position, distance (mm) | | N/A |
| G.7.3.2.4 | Strain relief and cord anchorage material | | N/A |
| G.7.4 | Cord Entry | | N/A |
| G.7.5 | Non-detachable cord bend protection | | N/A |
| G.7.5.1 | Requirements | | N/A |
| G.7.5.2 | Test method and compliance | | N/A |
| | Overall diameter or minor overall dimension, D (mm) | | — |
| | Radius of curvature after test (mm) | | — |
| G.7.6 | Supply wiring space | | N/A |
| G.7.6.1 | General requirements | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-------------|---|--|---------|
| G.7.6.2 | Stranded wire | | N/A |
| G.7.6.2.1 | Requirements | | N/A |
| G.7.6.2.2 | Test with 8 mm strand | | N/A |
| G.8 | Varistors | | N/A |
| G.8.1 | General requirements | No such varistors used | N/A |
| G.8.2 | Safeguards against fire | | N/A |
| G.8.2.1 | General | | N/A |
| G.8.2.2 | Varistor overload test | | N/A |
| G.8.2.3 | Temporary overvoltage test | | N/A |
| G.9 | Integrated circuit (IC) current limiters | | N/A |
| G.9.1 | Requirements | No IC current limiter provided within the equipment. | N/A |
| | IC limiter output current (max. 5A) | — | — |
| | Manufacturers' defined drift | — | — |
| G.9.2 | Test Program | | N/A |
| G.9.3 | Compliance | | N/A |
| G.10 | Resistors | | N/A |
| G.10.1 | General | No such component | N/A |
| G.10.2 | Conditioning | | N/A |
| G.10.3 | Resistor test | | N/A |
| G.10.4 | Voltage surge test | | N/A |
| G.10.5 | Impulse test | | N/A |
| G.10.6 | Overload test | | N/A |
| G.11 | Capacitors and RC units | | N/A |
| G.11.1 | General requirements | No such component | N/A |
| G.11.2 | Conditioning of capacitors and RC units | | N/A |
| G.11.3 | Rules for selecting capacitors | | N/A |
| G.12 | Optocouplers | | N/A |
| | Optocouplers comply with IEC 60747-5-5 with specifics | | N/A |
| | Type test voltage $V_{ini,a}$ | — | — |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-------------|---|--|---------|
| | Routine test voltage, $V_{ini, b}$ | | — |
| G.13 | Printed boards | | P |
| G.13.1 | General requirements | Class III equipment, no insulation requirements. | N/A |
| G.13.2 | Uncoated printed boards | | N/A |
| G.13.3 | Coated printed boards | | N/A |
| G.13.4 | Insulation between conductors on the same inner surface | | N/A |
| G.13.5 | Insulation between conductors on different surfaces | | N/A |
| | Distance through insulation.....: | | N/A |
| | Number of insulation layers (pcs) | | — |
| G.13.6 | Tests on coated printed boards | | N/A |
| G.13.6.1 | Sample preparation and preliminary inspection | | N/A |
| G.13.6.2 | Test method and compliance | | N/A |
| G.14 | Coating on components terminals | | N/A |
| G.14.1 | Requirements | No such component | N/A |
| G.15 | Pressurized liquid filled components | | N/A |
| G.15.1 | Requirements | No such component | N/A |
| G.15.2 | Test methods and compliance | | N/A |
| G.15.2.1 | Hydrostatic pressure test | | N/A |
| G.15.2.2 | Creep resistance test | | N/A |
| G.15.2.3 | Tubing and fittings compatibility test | | N/A |
| G.15.2.4 | Vibration test | | N/A |
| G.15.2.5 | Thermal cycling test | | N/A |
| G.15.2.6 | Force test | | N/A |
| G.15.3 | Compliance | | N/A |
| G.16 | IC including capacitor discharge function (ICX) | | N/A |
| G.16.1 | Condition for fault tested is not required | No such IC used | N/A |
| | ICX with associated circuitry tested in equipment | | N/A |
| | ICX tested separately | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|---------|---|---|---------|
| G.16.2 | Tests | | N/A |
| | Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test | | — |
| | Mains voltage that impulses to be superimposed on: | | — |
| | Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test | | — |
| G.16.3 | Capacitor discharge test | | N/A |
| H | CRITERIA FOR TELEPHONE RINGING SIGNALS | | N/A |
| H.1 | General | | N/A |
| H.2 | Method A | | N/A |
| H.3 | Method B | | N/A |
| H.3.1 | Ringing signal | No telephone ringing signal generated within the equipment. | N/A |
| H.3.1.1 | Frequency (Hz) | | — |
| H.3.1.2 | Voltage (V) | | — |
| H.3.1.3 | Cadence; time (s) and voltage (V) | | — |
| H.3.1.4 | Single fault current (mA): | | — |
| H.3.2 | Tripping device and monitoring voltage | | N/A |
| H.3.2.1 | Conditions for use of a tripping device or a monitoring voltage | | N/A |
| H.3.2.2 | Tripping device | | N/A |
| H.3.2.3 | Monitoring voltage (V) | | N/A |
| J | INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION | | N/A |
| J.1 | General | | N/A |
| | Winding wire insulation | | — |
| | Solid round winding wire, diameter (mm).....: | | N/A |
| | Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm ²) | | N/A |
| J.2/J.3 | Tests and Manufacturing | | — |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|---|---|--|---------|
| K SAFETY INTERLOCKS | | | N/A |
| K.1 General requirements | | | N/A |
| | Instructional safeguard.....: | No safety interlock provided within the equipment. | N/A |
| K.2 Components of safety interlock safeguard mechanism | | | N/A |
| K.3 Inadvertent change of operating mode | | | N/A |
| K.4 Interlock safeguard override | | | N/A |
| K.5 Fail-safe | | | N/A |
| K.5.1 | Under single fault condition | | N/A |
| K.6 Mechanically operated safety interlocks | | | N/A |
| K.6.1 | Endurance requirement | | N/A |
| K.6.2 | Test method and compliance | | N/A |
| K.7 Interlock circuit isolation | | | N/A |
| K.7.1 | Separation distance for contact gaps & interlock circuit elements | | N/A |
| | In circuit connected to mains, separation distance for contact gaps (mm) | | N/A |
| | In circuit isolated from mains, separation distance for contact gaps (mm) | | N/A |
| | Electric strength test before and after the test of K.7.2 | | N/A |
| K.7.2 | Overload test, Current (A) | | N/A |
| K.7.3 | Endurance test | | N/A |
| K.7.4 | Electric strength test | | N/A |
| L DISCONNECT DEVICES | | | N/A |
| L.1 General requirements | | | N/A |
| L.2 Permanently connected equipment | | | N/A |
| L.3 Parts that remain energized | | | N/A |
| L.4 Single-phase equipment | | | N/A |
| L.5 Three-phase equipment | | | N/A |
| L.6 Switches as disconnect devices | | | N/A |
| L.7 Plugs as disconnect devices | | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|--|---|---------|
| L.8 | Multiple power sources | | N/A |
| | Instructional safeguard.....: | | N/A |
| M | EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS | | P |
| M.1 | General requirements | | P |
| M.2 | Safety of batteries and their cells | | P |
| M.2.1 | Batteries and their cells comply with relevant IEC standards | (See appended table 4.1.2) | P |
| M.3 | Protection circuits for batteries provided within the equipment | | P |
| M.3.1 | Requirements | | P |
| M.3.2 | Test method | (See appended table Annex M) | P |
| | Overcharging of a rechargeable battery | No rechargeable battery used | N/A |
| | Excessive discharging | (See appended table Annex M) | P |
| | Unintentional charging of a non-rechargeable battery | No charging circuits within the equipment | N/A |
| | Reverse charging of a rechargeable battery | | N/A |
| M.3.3 | Compliance | No chemical leaked, no explosion occurred, no flame or expulsion of parts observed after tests. The battery temperature and battery charge/discharge current didn't exceed the specifications from manufacturer during the tests. | P |
| M.4 | Additional safeguards for equipment containing a portable secondary lithium battery | | N/A |
| M.4.1 | General | | N/A |
| M.4.2 | Charging safeguards | | N/A |
| M.4.2.1 | Requirements | | N/A |
| M.4.2.2 | Compliance | | N/A |
| M.4.3 | Fire enclosure | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|---|-----------------|---------|
| M.4.4 | Drop test of equipment containing a secondary lithium battery | | N/A |
| M.4.4.2 | Preparation and procedure for the drop test | | N/A |
| M.4.4.3 | Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%):: | | N/A |
| M.4.4.4 | Check of the charge/discharge function | | N/A |
| M.4.4.5 | Charge / discharge cycle test | | N/A |
| M.4.4.6 | Compliance | | N/A |
| M.5 | Risk of burn due to short-circuit during carrying | | N/A |
| M.5.1 | Requirement | | N/A |
| M.5.2 | Test method and compliance | | N/A |
| M.6 | Safeguards against short-circuits | | N/A |
| M.6.1 | External and internal faults | | N/A |
| M.6.2 | Compliance | | N/A |
| M.7 | Risk of explosion from lead acid and NiCd batteries | | N/A |
| M.7.1 | Ventilation preventing explosive gas concentration | | N/A |
| | Calculated hydrogen generation rate.....: | | N/A |
| M.7.2 | Test method and compliance | | N/A |
| | Minimum air flow rate, Q (m ³ /h) | | N/A |
| M.7.3 | Ventilation tests | | N/A |
| M.7.3.1 | General | | N/A |
| M.7.3.2 | Ventilation test – alternative 1 | | N/A |
| | Hydrogen gas concentration (%) | | N/A |
| M.7.3.3 | Ventilation test – alternative 2 | | N/A |
| | Obtained hydrogen generation rate | | N/A |
| M.7.3.4 | Ventilation test – alternative 3 | | N/A |
| | Hydrogen gas concentration (%) | | N/A |
| M.7.4 | Marking.....: | | N/A |
| M.8 | Protection against internal ignition from external spark sources of batteries with aqueous electrolyte | | N/A |
| M.8.1 | General | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-------------|---|-----------------------------|---------|
| M.8.2 | Test method | | N/A |
| M.8.2.1 | General | | N/A |
| M.8.2.2 | Estimation of hypothetical volume V_z (m^3/s) | | — |
| M.8.2.3 | Correction factors | | — |
| M.8.2.4 | Calculation of distance d (mm) | | — |
| M.9 | Preventing electrolyte spillage | | N/A |
| M.9.1 | Protection from electrolyte spillage | | N/A |
| M.9.2 | Tray for preventing electrolyte spillage | | N/A |
| M.10 | Instructions to prevent reasonably foreseeable misuse | | P |
| | Instructional safeguard.....: Provided in the manual. | | P |
| N | ELECTROCHEMICAL POTENTIALS | | N/A |
| | Material(s) used | Pollution degree considered | — |
| O | MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES | | N/A |
| | Value of X (mm) | | — |
| P | SAFEGUARDS AGAINST CONDUCTIVE OBJECTS | | N/A |
| P.1 | General | | N/A |
| P.2 | Safeguards against entry or consequences of entry of a foreign object | | N/A |
| P.2.1 | General | | N/A |
| P.2.2 | Safeguards against entry of a foreign object | | N/A |
| | Location and Dimensions (mm) | | — |
| P.2.3 | Safeguards against the consequences of entry of a foreign object | | N/A |
| P.2.3.1 | Safeguard requirements | | N/A |
| | The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment | | N/A |
| | Transportable equipment with metalized plastic parts | | N/A |
| P.2.3.2 | Consequence of entry test | | N/A |
| P.3 | Safeguards against spillage of internal liquids | | N/A |
| P.3.1 | General | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|---|------------------------|---------|
| P.3.2 | Determination of spillage consequences | | N/A |
| P.3.3 | Spillage safeguards | | N/A |
| P.3.4 | Compliance | | N/A |
| P.4 | Metallized coatings and adhesives securing parts | | N/A |
| P.4.1 | General | | N/A |
| P.4.2 | Tests | | N/A |
| | Conditioning, T _c (°C).....: | | — |
| | Duration (weeks) | | — |
| Q | CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING | | N/A |
| Q.1 | Limited power sources | | N/A |
| Q.1.1 | Requirements | | N/A |
| | a) Inherently limited output | | N/A |
| | b) Impedance limited output | | N/A |
| | c) Regulating network limited output | | N/A |
| | d) Overcurrent protective device limited output | | N/A |
| | e) IC current limiter complying with G.9 | | N/A |
| Q.1.2 | Test method and compliance | | N/A |
| | Current rating of overcurrent protective device (A): | | N/A |
| Q.2 | Test for external circuits – paired conductor cable | | N/A |
| | Maximum output current (A) | | N/A |
| | Current limiting method | | — |
| R | LIMITED SHORT CIRCUIT TEST | | N/A |
| R.1 | General | No such consideration. | N/A |
| R.2 | Test setup | | N/A |
| | Overcurrent protective device for test | | — |
| R.3 | Test method | | N/A |
| | Cord/cable used for test | | — |
| R.4 | Compliance | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--|---|-----------------|---------|
| S TESTS FOR RESISTANCE TO HEAT AND FIRE | | | N/A |
| S.1 | Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W | | N/A |
| | Samples, material | — | — |
| | Wall thickness (mm) | — | — |
| | Conditioning (°C) | — | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N/A |
| | - Material not consumed completely | | N/A |
| | - Material extinguishes within 30s | | N/A |
| | - No burning of layer or wrapping tissue | | N/A |
| S.2 | Flammability test for fire enclosure and fire barrier integrity | | N/A |
| | Samples, material | — | — |
| | Wall thickness (mm) | — | — |
| | Conditioning (°C) | — | — |
| S.3 | Flammability test for the bottom of a fire enclosure | | N/A |
| S.3.1 | Mounting of samples | | N/A |
| S.3.2 | Test method and compliance | | N/A |
| | Mounting of samples | — | — |
| | Wall thickness (mm) | — | — |
| S.4 | Flammability classification of materials | | N/A |
| S.5 | Flammability test for fire enclosure materials of equipment with a steady state power exceeding 4 000 W | | N/A |
| | Samples, material | — | — |
| | Wall thickness (mm) | — | — |
| | Conditioning (°C) | — | — |
| T | MECHANICAL STRENGTH TESTS | | P |
| T.1 | General | | P |
| T.2 | Steady force test, 10 N | | N/A |
| T.3 | Steady force test, 30 N | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
|--------|--------------------|-----------------|---------|

| | | | |
|-------|---|---|-----|
| T.4 | Steady force test, 100 N | | N/A |
| T.5 | Steady force test, 250 N | (See appended table T.5) | P |
| T.6 | Enclosure impact test | (See appended table T.6) | P |
| | Fall test | | P |
| | Swing test | | P |
| T.7 | Drop test | | N/A |
| T.8 | Stress relief test | (See appended table T.8) | P |
| T.9 | Glass Impact Test..... | No such glass | N/A |
| T.10 | Glass fragmentation test | | N/A |
| | Number of particles counted | No such glass | N/A |
| T.11 | Test for telescoping or rod antennas | | N/A |
| | Torque value (Nm) | No such antennas provided within the equipment. | N/A |
| U | MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION | | |
| U.1 | General | | N/A |
| | Instructional safeguard : | No CRT provided within the equipment. | N/A |
| U.2 | Test method and compliance for non-intrinsically protected CRTs | | |
| U.3 | Protective screen | | |
| V | DETERMINATION OF ACCESSIBLE PARTS | | |
| V.1 | Accessible parts of equipment | | |
| V.1.1 | General | | N/A |
| V.1.2 | Surfaces and openings tested with jointed test probes | | N/A |
| V.1.3 | Openings tested with straight unjointed test probes | | N/A |
| V.1.4 | Plugs, jacks, connectors tested with blunt probe | | N/A |
| V.1.5 | Slot openings tested with wedge probe | | N/A |
| V.1.6 | Terminals tested with rigid test wire | | N/A |
| V.2 | Accessible part criterion | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|---|------------------|---------|
| X | ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS) | | N/A |
| | Clearance.....: | | N/A |
| Y | CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES | | N/A |
| Y.1 | General | Indoor equipment | N/A |
| Y.2 | Resistance to UV radiation | | N/A |
| Y.3 | Resistance to corrosion | | N/A |
| Y.3 | Resistance to corrosion | | N/A |
| Y.3.1 | Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by | | N/A |
| Y.3.2 | Test apparatus | | N/A |
| Y.3.3 | Water – saturated sulphur dioxide atmosphere | | N/A |
| Y.3.4 | Test procedure.....: | | N/A |
| Y.3.5 | Compliance | | N/A |
| Y.4 | Gaskets | | N/A |
| Y.4.1 | General | | N/A |
| Y.4.2 | Gasket tests | | N/A |
| Y.4.3 | Tensile strength and elongation tests | | N/A |
| | Alternative test methods.....: | | N/A |
| Y.4.4 | Compression test | | N/A |
| Y.4.5 | Oil resistance | | N/A |
| Y.4.6 | Securing means | | N/A |
| Y.5 | Protection of equipment within an outdoor enclosure | | N/A |
| Y.5.1 | General | | N/A |
| Y.5.2 | Protection from moisture | | N/A |
| | Relevant tests of IEC 60529 or Y.5.3.....: | | N/A |
| Y.5.3 | Water spray test | | N/A |
| Y.5.4 | Protection from plants and vermin | | N/A |
| Y.5.5 | Protection from excessive dust | | N/A |
| Y.5.5.1 | General | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------|--|-----------------|---------|
| Y.5.5.2 | IP5X equipment | | N/A |
| Y.5.5.3 | IP6X equipment | | N/A |
| Y.6 | Mechanical strength of enclosures | | N/A |
| Y.6.1 | General | | N/A |
| Y.6.2 | Impact test.....: | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China
Inspection And Testing Society: yz.cnca.cn



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
|--------|--------------------|-----------------|---------|

| 5.2 TABLE: Classification of electrical energy sources | | Parameters | | | | P | |
|--|--|----------------------|------------|--------|--------------------|----------|-----|
| Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class | |
| | | | U (V) | I (mA) | Type ¹⁾ | | |
| 3Vd.c. | Internal circuit (Supplied by Coin battery) | Normal | 3 Vd.c. | -- | DC | -- | ES1 |
| | | Abnormal | -- | -- | -- | -- | |
| | | Single fault – SC/OC | -- | -- | -- | -- | |

Supplementary information:

1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc.
 2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.
 3) Test Conditions:
 Normal –Full load and no load.
 Abnormal – Overload output
 SC= short circuit; OC= open circuit

| 5.4.1.8 TABLE: Working voltage measurement | | | | | N/A |
|--|--|-----------------|------------------|----------------|----------|
| Location | | RMS voltage (V) | Peak voltage (V) | Frequency (Hz) | Comments |
| -- | | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| | | | | | |

| 5.4.1.10.2 TABLE: Vicat softening temperature of thermoplastics | | | | N/A |
|---|----|------------------------|----------------|------------------|
| Method..... | | ISO 306 / B50 | | — |
| Object/ Part No./Material | | Manufacturer/trademark | Thickness (mm) | T softening (°C) |
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |
| | | | | |

| 5.4.1.10.3 TABLE: Ball pressure test of thermoplastics | | | N/A |
|--|--|--------|-----|
| Allowed impression diameter (mm) | | ≤ 2 mm | — |
| | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



| IEC 62368-1 | | | | |
|----------------------------|------------------------|-----------------|-----------------------|--------------------------|
| Clause | Requirement + Test | Result - Remark | | Verdict |
| Object/Part No./Material | Manufacturer/trademark | Thickness (mm) | Test temperature (°C) | Impression diameter (mm) |
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |

| 5.4.2, 5.4.3 | TABLE: Minimum Clearances/Creepage distance | | | | | | | | N/A |
|---|---|----------------------|--------------------------|------------------|---------|------------------------|------------------|---------|-----|
| Clearance (cl) and creepage distance (cr) at/of/between: | U _p (V) | U _{rms} (V) | Freq ¹⁾ (kHz) | Required cl (mm) | cl (mm) | E.S. ²⁾ (V) | Required cr (mm) | cr (mm) | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | | | |
| 1) Only for frequency above 30 kHz 2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied) | | | | | | | | | |

| 5.4.4.2 | TABLE: Minimum distance through insulation | | | | | N/A | | |
|---|--|--|-------------|-------------------|-------------------|-----|--|--|
| Distance through insulation (DTI) at/of | Peak voltage (V) | | Insulation* | Required DTI (mm) | Measured DTI (mm) | | | |
| -- | -- | | -- | -- | -- | -- | | |
| Supplementary information: | | | | | | | | |
| *See also sub-clause 5.4.4.9 | | | | | | | | |

| 5.4.4.9 | TABLE: Solid insulation at frequencies >30 kHz | | | | | N/A |
|----------------------------|--|-----------------|----------------|------------------|------------|-----------------------|
| Insulation material | E _P | Frequency (kHz) | K _R | Thickness d (mm) | Insulation | V _{PW} (Vpk) |
| -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | |
| | | | | | | |

| 5.4.9 | TABLE: Electric strength tests | | | N/A |
|-------------------------------|--|------------------|--------------------|-----|
| Test voltage applied between: | Voltage shape (Surge, Impulse, AC, DC, etc.) | Test voltage (V) | Breakdown Yes / No | |
| Functional: | | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

| IEC 62368-1 | | | | |
|----------------------------|--------------------|-----------------|----|---------|
| Clause | Requirement + Test | Result - Remark | | Verdict |
| -- | -- | -- | -- | -- |
| Basic/supplementary: | | | | |
| -- | -- | -- | -- | -- |
| Reinforced: | | | | |
| -- | -- | -- | -- | -- |
| Routine Tests: | | | | |
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |
| | | | | |

| 5.5.2.2 | TABLE: Stored discharge on capacitors | | | | | N/A |
|---|--|---|-----------------|------------------------|----------|-----|
| Location | Supply voltage (V) | Operating and fault condition ¹⁾ | Switch position | Measured voltage (Vpk) | ES Class | |
| -- | -- | Normal | -- | -- | -- | -- |
| -- | -- | Single fault: SC/ OC | -- | -- | -- | -- |
| Supplementary information: | | | | | | |
| X-capacitors installed for testing are: | | | | | | |
| <input type="checkbox"/> bleeding resistor rating: | | | | | | |
| <input type="checkbox"/> ICX: | | | | | | |
| 1) Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit | | | | | | |

| 5.6.6 | TABLE: Resistance of protective conductors and terminations | | | | | N/A |
|----------------------------|--|----------------|------------------|----|-------------------------|-----|
| Location | Test current (A) | Duration (min) | Voltage drop (V) | | Resistance (Ω) | |
| -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | |
| | | | | | | |

| 5.7.4 | TABLE: Unearthed accessible parts | | | | | N/A |
|----------|--|--------------------|------------|---------|-------|----------|
| Location | Operating and fault conditions | Supply Voltage (V) | Parameters | | | ES class |
| | | | Voltage | Current | Freq. | |
| | | | | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



| IEC 62368-1 | | | | | | |
|-------------------------------------|-------------------------|----|-----------------|----|---------|----|
| Clause | Requirement + Test | | Result - Remark | | Verdict | |
| -- | Normal | -- | -- | -- | -- | -- |
| | Abnormal | -- | -- | -- | -- | -- |
| | Single fault: SC/ OC | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | |
| SC= short circuit; OC= open circuit | | | | | | |

| 5.7.5 | TABLE: Earthing accessible conductive part | | | | N/A | | | | |
|---------------------------------|--|--|--------------------|---------|-----|--|--|--|--|
| Supply voltage (V)..... | -- | | | | — | | | | |
| Phase(s) | <input type="checkbox"/> Single Phase; <input type="checkbox"/> Three Phase: <input type="checkbox"/> Delta <input type="checkbox"/> Wye | | | | | | | | |
| Power Distribution System | <input type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT | | | | | | | | |
| Location | Fault Condition No in IEC 60990 clause 6.2.2 | | Touch current (mA) | Comment | | | | | |
| -- | -- | | -- | -- | | | | | |
| Supplementary Information: | | | | | | | | | |
| | | | | | | | | | |

| 5.8 | TABLE: Backfeed safeguard in battery backed up supplies | | | | | N/A |
|----------------------------|---|-------------------------------|----------|--------------------------|-------------------|----------|
| Location | Supply voltage (V) | Operating and fault condition | Time (s) | Open-circuit voltage (V) | Touch current (A) | ES Class |
| -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | |
| | | | | | | |

| 6.2.2 | TABLE: Power source circuit classifications | | | | | P |
|---|---|-------------|-------------|------------------------------|----------|----------|
| Location | Operating and fault condition | Voltage (V) | Current (A) | Max. Power ¹⁾ (W) | Time (S) | PS class |
| Button battery output | Normal | 1.425 | 0.02 | 0.03 | 3 | PS1 |
| Supplementary information: | | | | | | |
| Abbreviation: SC= short circuit; OC= open circuit | | | | | | |

CTC Laboratories, Inc
 Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
|--------|--------------------|-----------------|---------|

1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.

| 6.2.3.1 | TABLE: Determination of Arcing PIS | | | | N/A |
|----------------------------|---|-------------------------------|------------------|-------------------------|-----|
| Location | Open circuit voltage after 3 s (Vpk) | Measured r.m.s current (A) | Calculated value | Arcing PIS? Yes / No | |
| -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | |
| | | | | | |

| 6.2.3.2 | TABLE: Determination of resistive PIS | | | | N/A |
|---|---------------------------------------|---------------------|-------------------------|--|-----|
| Location | Operating and fault condition | Dissipate power (W) | Arcing PIS? Yes / No | | |
| -- | -- | -- | -- | | |
| Supplementary information: | | | | | |
| All circuits are considered as resistive PIS A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter. If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification. A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault. | | | | | |

| 8.5.5 | TABLE: High pressure lamp | | | | N/A |
|----------------------------|---------------------------|------------------|---|--|-----|
| Lamp manufacturer | Lamp type | Explosion method | Longest axis of glass particle (mm) | Particle found beyond 1 m Yes / No | |
| -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | |
| | | | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | | | | Result - Remark | | Verdict | | |
|--|--|--------------|----------------------------------|--------------|---------------------------------------|--------------|---------------------------------------|--------------|--|
| 9.6 | TABLE: Temperature measurements for wireless power transmitters | | | | | | | | |
| Supply voltage (V) | -- | | | | | | | | |
| Max. transmit power of transmitter (W) | -- | | | | | | | | |
| Foreign objects | w/o receiver and direct contact | | with receiver and direct contact | | with receiver and at distance of 2 mm | | with receiver and at distance of 5 mm | | |
| | Object (°C) | Ambient (°C) | Object (°C) | Ambient (°C) | Object (°C) | Ambient (°C) | Object (°C) | Ambient (°C) | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | | | |

| 5.4.1.4, 9.3, B.1.5, B.2.6 | TABLE: Temperature measurements | | | | | | P |
|---|---------------------------------|--------------------|------------------|--------------------|--------|------------------------|------------------------|
| Supply voltage (V) | 3Vd.c. | | -- | -- | -- | -- | -- |
| Ambient temperature during test T_{amb} (°C) | 24.9-25.0 | | -- | -- | -- | -- | -- |
| Maximum measured temperature T of part/at: | T (°C) | | | | | | Allowed T_{max} (°C) |
| PCB near battery | 27.5 | | 52.5 | -- | -- | -- | 130 |
| Button battery | 27.6 | | 52.6 | -- | -- | -- | 60 |
| PCB near IC | 27.2 | | 52.2 | -- | -- | -- | 130 |
| Plastic enclosure inside near IC | 27.1 | | 52.1 | -- | -- | -- | 130 |
| Ambient | 25.0 | | Adjusted to 50.0 | -- | -- | -- | -- |
| Accessible parts | | | | | | | |
| Plastic enclosure outside near IC | 26.4 | | -- | -- | -- | -- | * 77 |
| Button | 26.4 | | -- | -- | -- | -- | * 77 |
| Ambient | 25.0 | | -- | -- | -- | -- | * 77 |
| Temperature T of winding: | t_1 (°C) | R_1 (Ω) | t_2 (°C) | R_2 (Ω) | T (°C) | Allowed T_{max} (°C) | Insulation class |
| -- | -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



| IEC 62368-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

* Temperature limit for TS1 of accessible enclosure according to Table 38 to be measured at normal ambient temperature.

Note 1: The apparatus was submitted and evaluated for maximum manufacturer's recommended ambient (T_{ma}) of 50 °C. Therefore the maximum temperatures measured are recalculated as follows: $T + (50 - T_{amb})$, where T is the maximum temperature measured during test and T_{amb} is the ambient temperature during the test.

Note 2: The temperatures were measured under the worse case normal mode defined in clause B.2.1.

| B.2.5 | | TABLE: Input test | | | | | | | P |
|--|----|-------------------|-------------|-------|-------------|---------|------------|--|---|
| U (V) | Hz | I (A) | I rated (A) | P (W) | P rated (W) | Fuse No | I fuse (A) | Condition/status | |
| 3Vd.c. | -- | 0.009 | -- | -- | -- | -- | -- | Normal operation, connected the EUT to Zigbee gateway to communicate with other devices. | |
| Supplementary information: | | | | | | | | | |
| The maximum measured current under rated voltage did not exceed 110% of the rated current. | | | | | | | | | |

| B.3, B.4 | | TABLE: Abnormal operating and fault condition tests | | | | | | P |
|---|--|---|--------------------|-----------|----------|------------------|--|---|
| Ambient temperature T_{amb} (°C) | | | | | | See below | — | |
| Power source for EUT: Manufacturer, model/type, outputrating....: | | | | | | -- | — | |
| Component No. | | Condition | Supply voltage (V) | Test time | Fuse no. | Fuse current (A) | Observation | |
| Battery | | Reverse battery polarity | 3Vd.c. | 10 min | -- | -- | After reverse battery polarity, EUT did not work, no chemical leaks, no explosion, no hazards. | |
| C1 | | SC | 3Vd.c. | 10 min | 10 min | -- | Unit operated normally, no chemical leaks, no explosion, no hazards. | |
| Supplementary information: | | | | | | | | |
| Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column "Abnormal/Fault." Specify if test condition by indicating "Abnormal" then the condition for a Clause B.3 test or "Single Fault" then the condition for Clause B.4. | | | | | | | | |
| 1) SC: Short-circuited | | | | | | | | |

| M.3 | TABLE: Protection circuits for batteries provided within the equipment | P |
|-----|--|---|
|-----|--|---|

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



| IEC 62368-1 | | | | | | | | | |
|--|----------------------------|------------------------------------|-------------|------------------------|-------------|-------------------------|------------------------------|--|--|
| Clause | Requirement + Test | | | Result - Remark | | Verdict | | | |
| Is it possible to install the battery in a reverse polarity position? : | | | | Yes | | — | | | |
| Equipment Specification | Charging | | | | | | | | |
| | Voltage (V) | | | Current (A) | | | | | |
| | -- | | | -- | | | | | |
| Manufacturer/type | Battery specification | | | | | | | | |
| | Non-rechargeable batteries | | | Rechargeable batteries | | | | | |
| | Discharging current (A) | Unintentional charging current (A) | Charging | | | Discharging current (A) | Reverse charging current (A) | | |
| | | | Voltage (V) | Current (A) | | | | | |
| PANASONIC CORPORATION / CR2032 | 225 mA | -- | -- | -- | -- | -- | -- | | |
| NECTIUM / CR2032 | 225 mA | -- | -- | -- | -- | -- | -- | | |
| Note: The tests of M.3.2 are applicable only when above appropriate data is not available. | | | | | | | | | |
| Specified battery temperature (°C)..... : | | | | -- | | | — | | |
| Component No. | Fault condition | Charge/ discharge mode | Test time | Temp. (°C) | Current (A) | Voltage (V) | Observation | | |
| Tested with battery: PANASONIC CORPORATION / CR2032 | | | | | | | | | |
| C1 | SC | Discharge mode | 7 h | -- | 9.3mA | 3.0 | NL, NS, NE, NF | | |
| Tested with battery: NECTIUM / CR2032 | | | | | | | | | |
| C1 | SC | Discharge mode | 7 h | -- | 9.3mA | 3.0 | NL, NS, NE, NF | | |
| Supplementary information: | | | | | | | | | |
| Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal. | | | | | | | | | |
| * the worst-case condition, other test data, see table B.3, B.4. | | | | | | | | | |

| M.4.2 | TABLE: Charging safeguards for equipment containing a secondary lithium battery | | | | N/A |
|---|---|-------------|--|----|-------------|
| Maximum specified charging voltage (V) | | | | — | |
| Maximum specified charging current (A) | | | | — | |
| Highest specified charging temperature (°C) | | | | -- | |
| Lowest specified charging temperature (°C) | | | | -- | |
| Battery | Operating | Measurement | | | Observation |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



| IEC 62368-1 | | | | | |
|--|---------------------|----------------------|----------------------|------------|---------|
| Clause | Requirement + Test | | Result - Remark | | Verdict |
| manufacturer/type | and fault condition | Charging voltage (V) | Charging current (A) | Temp. (°C) | |
| -- | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |
| | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature | | | | | |

| Q.1 | TABLE: Circuits intended for interconnection with building wiring (LPS) | | | | | | N/A |
|---------------------------------------|---|---------------------|----------|---------------------|-------|--------|-------|
| Output Circuit | Condition | U _{oc} (V) | Time (s) | I _{sc} (A) | | S (VA) | |
| | | | | Meas. | Limit | Meas. | Limit |
| -- | Normal | -- | -- | -- | -- | -- | -- |
| | Single fault | -- | -- | -- | -- | -- | -- |
| Supplementary Information: | | | | | | | |
| SC = short circuit, OC = open circuit | | | | | | | |

| T.2, T.3, T.4, T.5 | TABLE: Steady force test | | | | | | P |
|------------------------------|--------------------------|----------------|-------|-----------|-------------------|------------------------|---|
| Location / Part | Material | Thickness (mm) | Probe | Force (N) | Test Duration (s) | Observation | |
| Enclosure top (T.5) | Plastics | 1) | -- | 250 | 5 | No damage, no hazards. | |
| Enclosure sides (T.5) | Plastics | 1) | -- | 250 | 5 | No damage, no hazards. | |
| Enclosure bottom (T.5) | Plastics | 1) | -- | 250 | 5 | No damage, no hazards. | |
| Supplementary information: | | | | | | | |
| 1) See appended table 4.1.2. | | | | | | | |

| T.6, T.9 | TABLE: Impact test | P |
|----------|--------------------|---|
|----------|--------------------|---|

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



| IEC 62368-1 | | | | |
|------------------------------|--------------------|----------------|-----------------|------------------------|
| Clause | Requirement + Test | | Result - Remark | Verdict |
| Location/Part | Material | Thickness (mm) | Height (mm) | Observation |
| Enclosure top (T.6) | Plastic | 1) | 410 | No cracks, no hazards. |
| Enclosure sides (T.6) | Plastic | 1) | 410 | No cracks, no hazards. |
| Enclosure bottom (T.6) | Plastic | 1) | 410 | No cracks, no hazards. |
| Supplementary information: | | | | |
| 1) See appended table 4.1.2. | | | | |

| T.7 | TABLE: Drop test | | | | | N/A | | | |
|----------------------------|------------------|----------------|-------------|-------------|--|-----|--|--|--|
| Location/Part | Material | Thickness (mm) | Height (mm) | Observation | | | | | |
| -- | -- | -- | -- | -- | | | | | |
| Supplementary information: | | | | | | | | | |
| | | | | | | | | | |

| T.8 | TABLE: Stress relief test | | | | | P | | |
|------------------------------|---------------------------|----------------|-----------------------|--------------|-----------------------|---|--|--|
| Location/Part | Material | Thickness (mm) | Oven Temperature (°C) | Duration (h) | Observation | | | |
| Enclosure | Plastics | 1) | 72 | 7 | No crack, no hazards. | | | |
| Supplementary information: | | | | | | | | |
| 1) See appended table 4.1.2. | | | | | | | | |

| X | TABLE: Alternative method for determining minimum clearances distances | | | | N/A |
|------------------------------|--|------------------|------------------|----|-----|
| Clearance distanced between: | Peak of working voltage (V) | Required cl (mm) | Measured cl (mm) | | |
| -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| | | | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368-1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
|--------|--------------------|-----------------|---------|

| 4.1.2 TABLE: List of critical components | | | | | | P |
|--|--------------------------------|-----------------|---|------------------------|--|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard ²⁾ | Mark(s) of conformity ¹⁾ | |
| Plastic enclosure | SINOPLAST GROUP LTD | 7015-(xx) | HB or better, Min. 80°C | UL 94 | UL E335478 | |
| PCB | ZHUHAI CAMTECH CIRCUITS CO LTD | CT-M | V-0, 130°C | UL 94, UL796 | UL E343438 | |
| (Alternative) | Interchangeable | Interchangeable | V-0, 130°C | UL 94, UL796 | UL | |
| Button battery | PANASONIC CORPORATION | CR2032 | 3V, 225mAh; Max Abnormal Charging Current 10mA; Max. temperature: 60°C | IEC 60086-4: 2014 | CB Certif. No.: NL-59040 CB Test report No.: 4353813.50 | |
| (Alternative) | NECTIUM | CR2032 | 3V, 240mAh; Max Abnormal Charging Current 10 mA; Max. temperature: 85°C | IEC 60086-4: 2019 | Test report No.: LCSA112822 120S | |
| Supplementary information: | | | | | | |
| ¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039. | | | | | | |
| ²⁾ License available upon request | | | | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
|--------|--------------------|-----------------|---------|

ATTACHMENT TO TEST REPORT**IEC 62368-1****EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES**

(Audio/video, information and communication technology equipment – Part 1: Safety requirements)

Differences according to : EN IEC 62368-1:2020+A11:2020**Copyright © 2021 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.**

| | CENELEC COMMON MODIFICATIONS (EN) | P |
|----------|--|--------------------|
| | Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed "Z". | P |
| | Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords | P |
| 1 | Modification to Clause 3. | N/A |
| 3.3.19 | Sound exposure <i>Replace 3.3.19 of IEC 62368-1 with the following definitions:</i> | N/A |
| 3.3.19.1 | momentary exposure level, MEL metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2. Note 1 to entry: MEL is measured as A-weighted levels in dB. Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information. | Not such equipment |
| 3.3.19.3 | sound exposure, E 2002- weighted sound pressure (p) squared and integrated over a stated period of time, T Note 1 to entry: The SI unit is $\text{Pa}^2 \text{ s}$. $E = \int_0^T p(t)^2 dt$ | N/A |
| 3.3.19.4 | sound exposure level, SEL | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|----------|--|--------------------|---------|
| | <p>logarithmic measure of sound exposure relative to a reference value, E_0, typically the 1 kHz threshold of hearing in humans.</p> <p>Note 1 to entry: SEL is measured as A-weighted levels in dB.</p> $SEL = 10 \lg \left(\frac{E}{E_0} \right) \text{ dB}$ <p>Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.</p> | | |
| 3.3.19.5 | <p>digital signal level relative to full scale, dBFS</p> <p>levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused</p> <p>Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3.01 dBFS.</p> | | N/A |
| 2 | Modification to Clause 10 | | N/A |
| 10.6 | Safeguards against acoustic energy sources Replace 10.6 of IEC 62368-1 with the following: | | N/A |
| 10.6.1.1 | <p>Introduction</p> <p>Safeguard requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered.</p> <p>A personal music player is a portable equipment intended for use by an ordinary person, that:</p> <ul style="list-style-type: none">– is designed to allow the user to listen to audio or audiovisual content / material; and– uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and– has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). <p>EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment.</p> | Not such equipment | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------------|---|-----------------|---------|
| | <p>Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3.</p> <p>NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360.</p> <p>NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.</p> <p>Listening devices sold separately shall comply with the requirements of 10.6.6.</p> <p>These requirements are valid for music or video mode only.</p> <p>The requirements do not apply to:</p> <ul style="list-style-type: none">– professional equipment; <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p> <ul style="list-style-type: none">– hearing aid equipment and other devices for assistive listening;– the following type of analogue personal music players:<ul style="list-style-type: none">• long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and• cassette player/recorder; <p>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.</p> <ul style="list-style-type: none">– a player while connected to an external amplifier that does not allow the user to walk around while in use. <p>For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply.</p> <p>The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.</p> | | |
| 10.6.1.2 | <p>Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</p> <p>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general</p> | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------------|---|--------------------|---------|
| | public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body mounted devices, attention is drawn to EN 50360 and EN 50566. | | |
| 10.6.2 | Classification of devices without the capacity to estimate sound dose | | N/A |
| 10.6.2.1 | General This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3. For classifying the acoustic output $L_{Aeq,T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, T becomes the duration of the song. NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dB. | Not such equipment | N/A |
| 10.6.2.2 | RS1 limits (to be superseded, see 10.6.3.2) RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 85 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------------|--|--------------------|---------|
| | listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. – The RS1 limits will be updated for all devices as per 10.6.3.2. | | |
| 10.6.2.3 | RS2 limits (to be superseded, see 10.6.3.3) RS2 is a class 2 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 100 dB(A) when playing the fixed "programme simulation noise" as described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1. | | N/A |
| 10.6.2.4 | RS3 limits RS3 is a class 3 acoustic energy source that exceeds RS2 limits. | | N/A |
| 10.6.3 | Classification of devices (new) | | N/A |
| 10.6.3.1 | General Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below. | Not such equipment | N/A |
| 10.6.3.2 | RS1 limits (new) RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|----------|---|--------------------|---------|
| 10.6.3.3 | <p>“programme simulation noise” described in EN 50332-1.</p> <p>RS2 limits (new)</p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1. | | N/A |
| 10.6.4 | Requirements for maximum sound exposure | | N/A |
| 10.6.4.1 | <p>Measurement methods</p> <p>All volume controls shall be turned to maximum during tests.</p> <p>Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.</p> | Not such equipment | N/A |
| 10.6.4.2 | <p>Protection of persons</p> <p>Except as given below, protection requirements for parts accessible to ordinary persons, instructed persons and skilled persons are given in 4.3.</p> <p>NOTE 1 Volume control is not considered a safeguard.</p> <p>Between RS2 and an ordinary person, the basic safeguard may be replaced by an instructional safeguard in accordance with Clause F.5, except that the instructional safeguard shall be placed on the equipment, or on the packaging, or in the instruction manual.</p> <p>Alternatively, the instructional safeguard may be given through the equipment display during use.</p> <p>The elements of the instructional safeguard shall be as follows:</p> <ul style="list-style-type: none"> – element 1a: the symbol  IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------------|---|--------------------|---------|
| | <p>periods.” Or equivalent wording</p> <p>An equipment safeguard shall prevent exposure of an ordinary person to an RS2 source without intentional physical action from the ordinary person and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off.</p> <p>The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.</p> <p>NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed.</p> <p>NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off.</p> <p>A skilled person shall not be unintentionally exposed to RS3.</p> | | |
| 10.6.5 | Requirements for dose-based systems | | N/A |
| 10.6.5.1 | <p>General requirements</p> <p>Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause.</p> <p>The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration.</p> <p>The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.</p> | Not such equipment | N/A |
| 10.6.5.2 | Dose-based warning and requirements | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------------|---|--------------------|---------|
| | <p>When a dose of 100 % CSD is reached, and at least at every 100 % further increase of CSD, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1.</p> <p>The warning shall at least clearly indicate that listening above 100 % CSD leads to the risk of hearing damage or loss.</p> | | |
| 10.6.5.3 | <p>Exposure-based requirements</p> <p>With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at.</p> <p>The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3.</p> <p>The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster.</p> <p>Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than -10 dBFS for a digital interface.</p> <p>NOTE In case the source is known not to be music (or test signal), the EL may be disabled.</p> | | N/A |
| 10.6.6 | <p>Requirements for listening devices (headphones, earphones, etc.)</p> | | N/A |
| 10.6.6.1 | <p>Corded listening devices with analogue input</p> <p>With 94 dB Laeq acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed "programme simulation noise" as described in EN 50332-1 shall be ≥ 75 mV.</p> <p>NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV.</p> | Not such equipment | N/A |
| 10.6.6.2 | <p>Corded listening devices with digital input</p> <p>With any playing device playing the fixed "programme simulation noise" described in EN 50332-1, and with the</p> | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------------|--|-----------------|---------|
| | volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. | | |
| 10.6.6.3 | Cordless listening devices In cordless mode, – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. | | N/A |
| 10.6.6.4 | Measurement method Measurements shall be made in accordance with EN 50332-2 as applicable. | | N/A |
| 3 | Modification to the whole document | | P |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | | | | Result - Remark | Verdict |
|--|---|--------------|-------------------------|-----------------------|-----------------|-----------------------|
| Delete all the “country” notes in the reference document according to the following list: | 0.2.1 | Note 1 and 2 | 1 | Note 4 and 5 | 3.3.8.1 | Note 2 |
| | 3.3.8.3 | Note 1 | 4.1.15 | Note | 4.7.3 | Note 1 and 2 |
| | 5.2.2.2 | Note | 5.4.2.3.2.2 Table 12 | Note c | 5.4.2.3.2.4 | Note 1 and 3 |
| | 5.4.2.3.2.4 | Note 2 | 5.4.2.5 | Note 2 | 5.4.5.1 | Note |
| | Table 13 | | | | | |
| | 5.4.10.2.1 | Note | 5.4.10.2.2 | Note | 5.4.10.2.3 | Note |
| | 5.5.2.1 | Note | 5.5.6 | Note | 5.6.4.2.1 | Note 2 and 3 and 4 |
| | 5.6.8 | Note 2 | 5.7.6 | Note | 5.7.7.1 | Note 1 and Note 2 |
| | 8.5.4.2.3 | Note | 10.2.1 Table 39 | Note 3 and 4 and 5 | 10.5.3 | Note 2 |
| | 10.6.1 | Note 3 | F.3.3.6 | Note 3 | Y.4.1 | Note |
| | Y.4.5 | Note | | | | |
| 4 | Modification to Clause 1 | | | | | P |
| 1 | Add the following note: <i>NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.</i> | | | | | |
| 5 | Modification to 4. Z1 | | | | | N/A |
| 4.Z1 | Add the following new subclause after 4.9: To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. mains , protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for pluggable equipment type B or | | | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-------------|---|---------------------------------------|---------|
| | <p>permanently connected equipment, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for pluggable equipment type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p> | | |
| 6 | Modification to 5.4.2.3.2.4 | | N/A |
| 5.4.2.3.2.4 | <p>Add the following to the end of this subclause:</p> <p>The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009.</p> | No connection to external circuit. | N/A |
| 7 | Modification to 10.2.1 | | N/A |
| 10.2.1 | <p>Add the following to c) and d) in table 39: For additional requirements, see 10.5.1.</p> | No such radiation from the equipment. | N/A |
| 8 | Modification to 10.5.1 | | N/A |
| 10.5.1 | <p>Add the following after the first paragraph:</p> <p>For RS 1 compliance is checked by measurement under the following conditions:</p> <p>In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.</p> <p>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.</p> <p>The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus.</p> <p>Moreover, the measurement shall be made under fault conditions causing an increase of the high voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.</p> <p>For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.</p> <p>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.</p> | | N/A |
| 9 | Modification to G.7.1 | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|---|-------------------------------------|---------|
| G.7.1 | Add the following note: NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD. | Not directly connected to the mains | N/A |
| 10 | Modification to Bibliography | | P |
| | Add the following notes for the standards indicated: IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331. | P | |
| 11 | ADDITION OF ANNEXES | | P |
| ZB | ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN) | | P |
| 4.1.15 | Denmark, Finland, Norway and Sweden To the end of the subclause the following is added: Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Denmark : "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord." In Finland : "Laite on liittäävä suojakoskettimilla varustettuun pistorasiaan" In Norway : "Apparatet må tilkoples jordet stikkontakt" In Sweden : "Apparaten skall anslutas till jordat" | Not connected to the Mains | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
| | uttag" | | |

| | | | |
|----------------------------|--|---------------------------------|-----|
| 4.7.3 | United Kingdom To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex | | N/A |
| 5.2.2.2 | Denmark After the 2 nd paragraph add the following: A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | No high touch current measured. | N/A |
| 5.4.11.1 and Annex G | Finland and Sweden To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either <ul style="list-style-type: none">• two layers of thin sheet material, each of which shall pass the electric strength test below, or• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition <ul style="list-style-type: none">• passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. | No such external circuits. | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|-----------|--|--------------------|---------|
| | <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none">the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11;the additional testing shall be performed on all the test specimens as described in EN 60384-14; <p>the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.</p> | | |
| 5.5.2.1 | <p>Norway</p> <p>After the 3rd paragraph the following is added:</p> <p>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).</p> | | N/A |
| 5.5.6 | <p>Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.2.</p> | No such resistors. | N/A |
| 5.6.1 | <p>Denmark</p> <p>Add to the end of the subclause</p> <p>Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment.</p> <p><i>Justification:</i></p> <p>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.</p> | | N/A |
| 5.6.4.2.1 | <p>Ireland and United Kingdom</p> <p>After the indent for pluggable equipment type A, the following is added:</p> <p>– the protective current rating is taken to be 13 A, this being the largest rating of fuse used in the mains plug.</p> | | N/A |
| 5.6.4.2.1 | <p>France</p> <p>After the indent for pluggable equipment type A, the following is added:</p> <p>– in certain cases, the protective current rating of the circuit supplied from the mains is taken as 20 A instead of 16 A.</p> | | N/A |
| 5.6.5.1 | To the second paragraph the following is added: | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|---------|---|------------------|---------|
| | The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm ² to 1,5 mm ² in cross-sectional area. | | |
| 5.6.8 | Norway To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as class I equipment . See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted. | | N/A |
| 5.7.6 | Denmark To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | | N/A |
| 5.7.6.2 | Denmark To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA . | | N/A |
| 5.7.7.1 | Norway and Sweden To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic | Not such system. | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|---------------|--|------------------------------|---------|
| | <p>isolator, see EN 60728-11)"</p> <p>NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):</p> <p>"Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett 74isa74llers en galvanisk isolator mellom apparatet og kabel-TV nettet."</p> <p>Translation to Swedish:</p> <p>"Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i 74isa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet."</p> | | |
| 8.5.4.2.3 | <p>United Kingdom</p> <p>Add the following after the 2nd dash bullet in 3rd paragraph:</p> <p>An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.</p> | No external circuits. | N/A |
| B.3.1 and B.4 | <p>Ireland and United Kingdom</p> <p>The following is applicable:</p> <p>To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment, until the requirements of Annexes B.3.1 and B.4 are met</p> | Not direct plug-in equipment | N/A |
| G.4.2 | <p>Denmark</p> <p>To the end of the subclause the following is added:</p> <p>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with</p> | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|---|------------------------------|---------|
| | <p>earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.</p> <p>Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.</p> <p>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.</p> <p>Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a</p> <p><i>Justification:</i> Heavy Current Regulations, Section 6c</p> | | |
| G.4.2 | <p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.</p> | Not direct plug-in equipment | N/A |
| G.7.1 | <p>United Kingdom</p> <p>To the first paragraph the following is added:</p> <p>Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations.</p> <p>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p> | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--|------------------------------|---------|
| G.7.1 | Ireland To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard | | N/A |
| G.7.2 | Ireland and United Kingdom To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm ² is allowed for equipment which is rated over 10 A and up to and including 13 A. | | N/A |
| ZC | ANNEX ZC, NATIONAL DEVIATIONS (EN) | | N/A |
| 10.5.2 | Germany The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. <i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de | No CRT within the equipment. | N/A |
| ZD | IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN) | | N/A |
| | | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 1

| Clause | Requirement + Test | Result - Remark | | Verdict |
|--------|---|-------------------|--------------------------|---------|
| | Type of flexible cord | Code designations | | |
| | | IEC | CENELEC | |
| | PVC insulated cords | | | |
| | Flat twin tinsel cord | 60227 IEC 41 | H03VH-Y | |
| | Light polyvinyl chloride sheathed flexible cord | 60227 IEC 52 | H03VV-F H03VVH2-F | |
| | Ordinary polyvinyl chloride sheathed flexible cord | 60227 IEC 53 | H05VV-F H05VVH2-F | |
| | Rubber insulated cords | | | |
| | Braided cord | 60245 IEC 51 | H03RT-F | |
| | Ordinary tough rubber sheathed flexible cord | 60245 IEC 53 | H05RR-F | |
| | Ordinary polychloroprene sheathed flexible cord | 60245 IEC 57 | H05RN-F | |
| | Heavy polychloroprene sheathed flexible cord | 60245 IEC 68 | H07RN-F | |
| | Cords having high flexibility | | | |
| | Rubber insulated and sheathed cord | 60245 IEC 86 | H03RR-H | |
| | Rubber insulated, crosslinked PVC sheathed cord | 60245 IEC 87 | H03RV4-H | |
| | Crosslinked PVC insulated and sheathed cord | 60245 IEC 88 | H03V4V4-H | |
| | Cords insulated and sheathed with halogen-free thermoplastic compounds | | | |
| | Light halogen-free thermoplastic insulated and sheathed flexible cords | | H03Z1Z1-F H03Z1Z1H2-F | |
| | Ordinary halogen-free thermoplastic insulated and sheathed flexible cords | | H05Z1Z1-F H05Z1Z1H2-F | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC 62368_1E ATTACHMENT 2

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
|--------|--------------------|-----------------|---------|

ATTACHMENT TO TEST REPORT

IEC 62368-1

(AUSTRALIA / NEW ZEALAND) NATIONAL DIFFERENCES
(Audio/video, information and communication technology equipment)

| | |
|--------------------------------|---------------------------|
| Differences according to | AS/NZS 62368.1:2022 |
| TRF template used: | IECEE OD-2020-F3, Ed. 1.1 |
| Attachment Form No. | AU_NZ_ND_IEC62368_1E |
| Attachment Originator | JAS-ANZ |
| Master Attachment..... | 2022-07-01 |

Copyright © 2020 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.

| | National Differences | P |
|----------------|---|---|
| Appendix ZZ | Variations to IEC 62368-1:2018 (ED. 3.0) for Australia and New Zealand | P |
| ZZ1 Scope | This Appendix lists the normative variations to IEC 62368-1:2018 (ED. 3.0) | P |
| ZZ2 Variations | The following modifications are required for Australian/New Zealand conditions: | P |
| 2 | After the first paragraph, add the following: The Australian or Australian/New Zealand Standards listed below are modified adoptions of, or not equivalent to, the IEC normative references and are required for the application of this Standard. All references in the source text to those IEC normative references shall be replaced by references to the corresponding Australian or Australian/New Zealand Standards. Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably -AS/NZS 3112, <i>Approval and test specification—Plugs and socket-outlets</i> -AS/NZS 3123, <i>Approval and test specification—Plugs, socket-outlets and couplers for general industrial application</i> -AS/NZS 3191, <i>Electric flexible cords</i> -AS/NZS 60884.1. <i>Plugs and socket-outlets for household and similar purposes, Part 1: General requirements</i> -IEC 60086-2 <i>Primary batteries — Part 2: Physical and electrical specifications</i> -AS/NZS 60065, <i>Audio, video and similar electronic apparatus—Safety requirements</i> | P |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 2

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--|-----------------|---------|
| | <p>(IEC 60065:2015 (ED.8.0) MOD)</p> <p>-AS/NZS 60320.1, <i>Appliance couplers for household and similar general purposes, Part 1: General requirements (IEC 60320-1, Ed.2.1 (2007) MOD)</i></p> <p>-AS/NZS 60320.2.2, <i>Appliance couplers for household and similar general purposes Part 2.2: Interconnection couplers for household and similar equipment (IEC 60320-2-2, Ed.2.0 (1998) MOD)</i></p> <p>-AS/NZS 60695.2.11, <i>Fire hazard testing, Part 2.11: Glowing/hot wire based test methods—Glow-wire flammability test method for end-products</i></p> <p>-AS/NZS 60695.11.5, <i>Fire hazard testing, Part 11.5: Test flames—Needle-flame test method—Apparatus, confirmatory test arrangement and guidance</i></p> <p>-AS/NZS 60695.11.10, <i>Fire hazard testing, Part 11.10: Test flames—50 W horizontal and vertical flame test methods</i></p> <p>-AS/NZS 60884.1, <i>Plugs and socket-outlets for household and similar purposes, Part 1: General requirements</i></p> <p>-AS/NZS 60950.1, <i>Information technology equipment—Safety, Part 1: General requirements (IEC 60950-1, Ed.2.2 (2013), MOD)</i></p> <p>IEC 61032:1997, <i>Protection of persons and equipment by enclosures—Probes for verification</i></p> <p>-AS/NZS 61558.1, <i>Safety of Power Transformers, Power Supplies, Reactors and Similar Products, Part 1: General requirements and tests (IEC 61558-1 Ed 3, MOD)</i></p> <p>-AS/NZS 61558.2.16, <i>Safety of transformers, reactors, power supply units and similar products for voltages up to 1 100 V, Part 2.16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units.</i></p> | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 2

| Clause | Requirement + Test | Result - Remark | Verdict |
|---|---|---|------------------------|
| 4.7.2 | <p>Requirements</p> <p><i>Delete the text of the second paragraph and replace with the following:</i></p> <p>Equipment with a plug portion, suitable for insertion into a 10 A 3-pin flat-pin socket-outlet conforming to AS/NZS 3112, shall conform to the requirements in AS/NZS 3112 for equipment with integral pins for insertion into socket-outlets.</p> <p>Conformity is checked by inspection and, if necessary, by the tests in AS/NZS 3112.</p> <p>NOTE: Equipment with plug portions for use in countries other than Australia and New Zealand will need to conform to other countries' requirements</p> <p>Note Additional AS/NZS 3112 Appendix J,TRF is appended to end of this TRF.</p> | Not direct plug-in equipment. | N/A |
| 4.7.3 | <p>Compliance Criteria</p> <p><i>Delete this clause</i></p> | | N/A |
| 4.8.1 | <p>General</p> <p><i>After second list, add the following:</i></p> <p>NOTE: Refer to the Consumer Goods (Products Containing Button/Coin Batteries) Safety Standard 2020 and Consumer Goods (Products Containing Button/Coin Batteries) Information Standard 2020 for more information on button cell batteries in Australia..</p> | | P |
| 5.4.10.2.1 | <p>General</p> <p><i>Delete the first paragraph and replace with the following:</i></p> <p>In Australia, the separation is checked by the test given in both Clause 5.4.10.2.2 and Clause 5.4.10.2.3.</p> <p>In New Zealand, the separation is checked by the test given in either 5.4.10.2.2 or 5.4.10.2.3.</p> | | N/A |
| Table 28 | <i>Delete Table 28 and replace with the following:</i> | | |
| Parts | Impulse test | | Steady state test |
| | New Zealand | Australia | New Zealand Austral ia |
| Parts indicated in Clause 5.4.10.1 a) ^a | 2.5 kV | 7.0 kV for hand-held telephones and headsets, 2.5 kV for other equipment. | 1.5 kV 3 kV |
| Parts indicated in Clause 5.4.10.1 b) and c) ^b | 1.5 kV ^c | | 1.0 kV 1.5 kV |
| <p>^a Surge suppressors shall not be removed.</p> <p>^b Surge suppressors may be removed, provided that such devices pass the impulse test of Clause 5.4.10.2.2 when tested as components outside the equipment.</p> <p>^c During this test, it is allowed for a surge suppressor to operate and for a sparkover to occur in a GDT.</p> | | | |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 2

| Clause | Requirement + Test | Result - Remark | Verdict |
|------------------------------|--|----------------------------|---------|
| 5.4.10.2.2 | <p><i>Delete “NOTE” and replace with “NOTE 1”.</i></p> <p>After NOTE 1, <i>add the following:</i></p> <p>NOTE 2: For Australia, the 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines.</p> <p>NOTE 3: For Australia, the value of 2.5 kV for Clause 5.4.10.1 a) was chosen to ensure the adequacy of the insulation concerned and does not necessarily simulate likely overvoltages.</p> | | N/A |
| 5.4.10.2.3 | <p><i>Delete “NOTE” and replace with “NOTE 1”.</i></p> <p>After NOTE 1, <i>add the following:</i></p> <p>NOTE 2: For Australia, where there are capacitors across the insulation under test, it is recommended that d.c. test voltages are used.</p> <p>NOTE 3: The 3 kV and 1.5 kV values for Australia have been determined considering the low frequency induced voltages from the power supply distribution system.</p> | | N/A |
| 6 | Electrically-caused fire | | N/A |
| 6.6 | After Clause 6.6, <i>add the new Clauses 6.201 as follows:</i> 6.201 External power supplies, docking stations and other similar devices (see special national conditions) | | N/A |
| 8.6 | Stability of equipment | | N/A |
| Table 36 | Footnote ^a , after first sentence, <i>add the following:</i> Equipment having displays with moving images shall include “television sets and display devices”. | | N/A |
| 8.6.1 | After Clause 8.6.1 <i>add the following new clauses:</i> 8.6.201 Restraining Device fixing point (see special national conditions) 8.6.202 Restraining device (see special national conditions) | | N/A |
| Annex F Paragraph F.3.3.4 | Rated Voltage <i>Delete “NOTE” and replace with NOTE1”</i> After NOTE 1, <i>add the following</i> Equipment that is intended for connection to the supply mains in Australia and New Zealand shall be marked with: (a) A rated voltage of: • 230 V for single phase equipment • 400 V for poly phase equipment Or (b) A rated voltage range that includes: • 230 V for single phase equipment • 400 V for poly phase equipment NOTE 2: equipment that is not rated as above is not suitable for direct connection to the supply mains in Australia or new Zealand. | Not connected to the Mains | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 2

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------------------------------|---|--------------------------------|---------|
| Annex F.3.3.5 | After the list, <i>add the following</i> Equipment that is intended for connection to supply mains in Australia or New Zealand shall be marked with a rated frequency of 50 Hz or a rated frequency range or nominal value which includes 50Hz | | N/A |
| Annex F.3.8 | After “The DC output of an external power supply”, insert “or docking stations and other similar external devices” | | N/A |
| Annex G Paragraph G.4.2 | Mains connectors 1 After “IEC 60320”, insert “or AS/NZS 60320 series”. 2 After “IEC 60906-1”, insert “or AS/NZS 3123” 3 <i>After first paragraph add the following:</i> 10 A or 15 A 250 V flat pin plugs for the connection of equipment to mains-powered socket-outlets for household or similar general use shall comply with AS/NZS 3112 or AS/NZS 60884.1. | | N/A |
| Paragraph G.5.3.1 | Transformers, General 1 Third dashed point <i>replace</i> ‘IEC 61558-1 and the relevant parts of IEC 61558-2’ with ‘AS/NZS 61558-1 and the relevant parts of AS/NZS 61558.2’ 2 Fourth dashed point <i>replace</i> ‘IEC 61558-2-16’ with ‘AS/NZS 61558.2.16’. | | N/A |
| Annex G.7.1 | Mains supply cords, General Fourth dashed paragraph, <i>replace</i> ‘IEC 60320-1’ with ‘AS/NZS 60320.1’ | No mains supply cord provided. | N/A |
| Table G.7 | Sizes of conductors 1 First column, second row, <i>delete</i> “6” and <i>replace</i> with “7.5” 2 Second column, second row, <i>delete</i> ‘0,75’ and <i>replace</i> with ‘0.75 ^b 3 <i>Delete</i> NOTE 1. 4 <i>Replace</i> ‘NOTE 2’ with ‘NOTE: 5 <i>Delete</i> ‘Footnote b’ and <i>replace</i> with the following: ^b This nominal cross-sectional area is only allowed for Class II appliances if the length of the power supply cord, measured between the point where the cord, or cord guard, enters the appliance, and the entry to the plug does not exceed 2 m (0.5 mm ² three-core supply flexible cords are not permitted; see AS/NZS 3191). 6 Footnote c <i>replace</i> ‘IEC 60320-1’ with ‘AS/NZS 60320.1’ 7 Footnote d <i>replace</i> ‘IEC 60320-1’ with ‘AS/NZS 60320.1’ | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhua Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 2

| Clause | Requirement + Test | Result - Remark | Verdict |
|--|--|---|---------|
| Annex M M.2.1 | <i>Add “IEC 60086-2” to the list</i> | | N/A |
| Annex M Paragraph M.3.2 | Test method Delete “NOTE” and replace with “NOTE 1” After NOTE 1 add the following: NOTE 2: In cases where the voltage source is provided by power from an unassociated power source, consideration should be given to the effects of possible single fault conditions in the unassociated equipment. If the power source is unknown then it should be assumed that the maximum limit of ES1 may be applied to the source input under assumed single fault conditions in the source when assessing the charging circuit in the equipment under test. | No charging circuits within the equipment | N/A |
| | | | |
| | Special national conditions (if any) | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 2

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--|-----------------|---------|
| 6.201 | <p>External power supplies, docking stations and other similar devices</p> <p>For external power supplies, docking stations and other similar devices, during and after abnormal operating conditions and during single fault conditions the output voltage—</p> <ul style="list-style-type: none">(a) at all ES1 outlets or connectors shall not increase by more than 10 % of the output rated voltage under normal operating conditions, measured after 3 s of introducing a single fault condition and after 3 s of introducing abnormal operating conditions; and(b) of a USB outlet or connector shall not increase by more than 3 V or 10 % of the output rated voltage under normal operating conditions, whichever is higher, measured after 3 seconds of introducing a single fault condition and after 3 s of introducing abnormal operating conditions <p>For equipment with multiple rated voltages at the output, the requirements apply with the equipment configured for each output rated voltage in turn</p> <p>NOTE: This is intended to reduce the possibility of battery fire or explosion in attached equipment or accessories when charging secondary lithium batteries. The 3 s measurement delay is based on IEC document 108/742/INF, TC 108, <i>Standards Interpretation Panel Question 15 — Output voltage</i>, in relation to similar requirements in IEC 62368-3:2017.</p> <p>Conformity shall be checked by measurement, taking into account the abnormal operating conditions of Annex B.3 and the simulated single fault conditions of Annex B.4.</p> | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



IEC62368_1E – ATTACHMENT 2

| Clause | Requirement + Test | Result - Remark | Verdict |
|---------|---|-----------------|---------|
| 8.6.201 | <p>Restraining device fixing point Freestanding-capable MS2 and MS3 television sets and display devices shall be provided with a fixing point to facilitate the anchoring of the equipment from toppling</p> <p>The fixing point shall conform to Clause 8.7 where the fixing point uses a wall, ceiling or other structure mount. Alternatively, the fixing point shall be capable of withstanding a pull equal to the mass of the equipment in all directions without damage</p> <p>Instructions for installation or instructions for use shall be provided to specify correct use of the fixing point</p> | | N/A |
| 8.6.202 | <p>Restraining device MS2 and MS3 television sets and display devices shall be provided with a restraining device and associated hardware to attach to the television set or display device.</p> <p>The restraining device shall be capable of withstanding a pull equal to the mass of the equipment in all directions.</p> <p>Instructions for installation or instructions for use shall be provided to specify correct use of the fixing point</p> | | N/A |

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



Attachment 3

Photo Documentation

Page 86 of 90

Report No.: CTC2025222570

Product: Tempereture and Humidity Sensor T1

Type Designation: See Model/Type reference on page 3 of main report for details



Figure 1 Overall view



Figure 2 Overall view

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China Inspection And Testing Society: yz.cnca.cn



Attachment 3

Photo Documentation

Page 87 of 90

Report No.: CTC2025222570

Product: Tempereture and Humidity Sensor T1

Type Designation: See Model/Type reference on page 3 of main report for details



Figure 3 External view

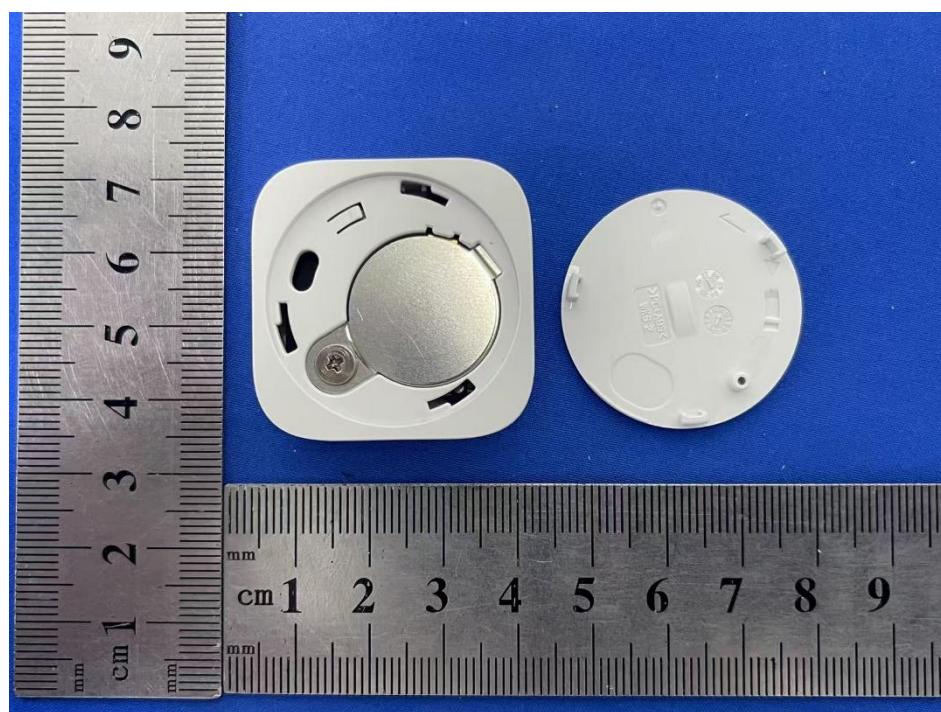


Figure 4 Internal view

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China Inspection And Testing Society: yz.cnca.cn



Attachment 3

Photo Documentation

Page 88 of 90

Report No.: CTC2025222570

Product: Tempereture and Humidity Sensor T1

Type Designation: See Model/Type reference on page 3 of main report for details

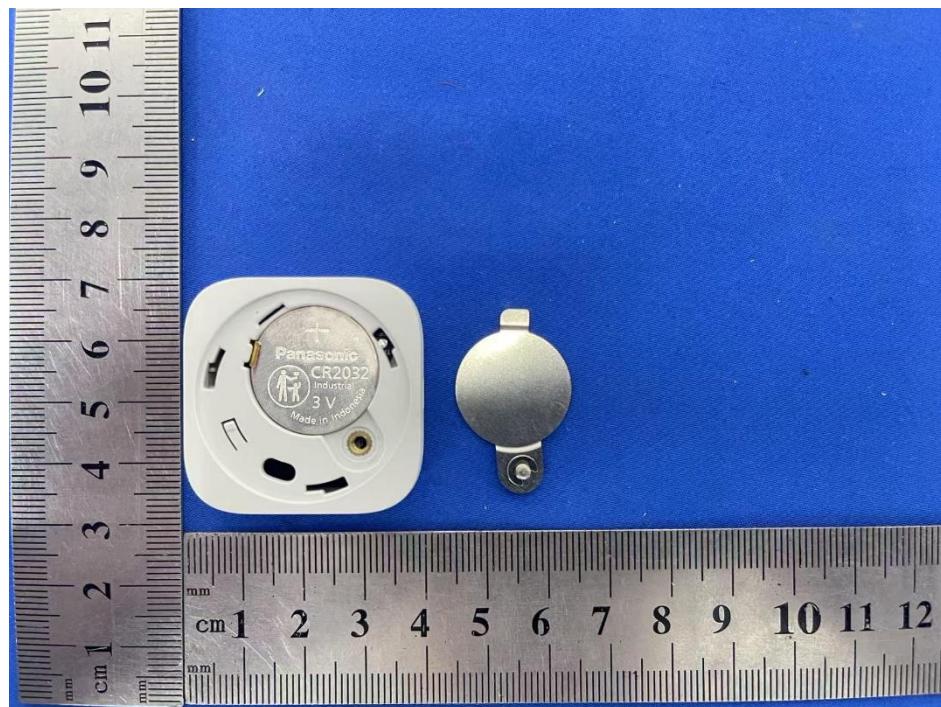


Figure 5 Internal view

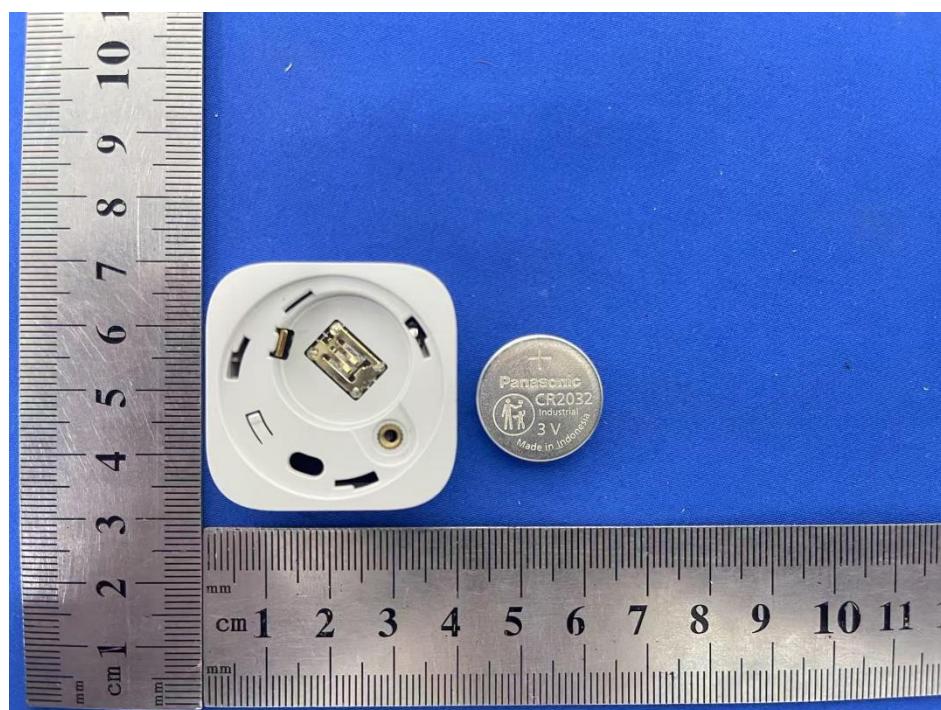


Figure 6 Internal view

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China Inspection And Testing Society: yz.cnca.cn



Attachment 3

Photo Documentation

Page 89 of 90

Report No.: CTC2025222570

Product: Tempereture and Humidity Sensor T1

Type Designation: See Model/Type reference on page 3 of main report for details

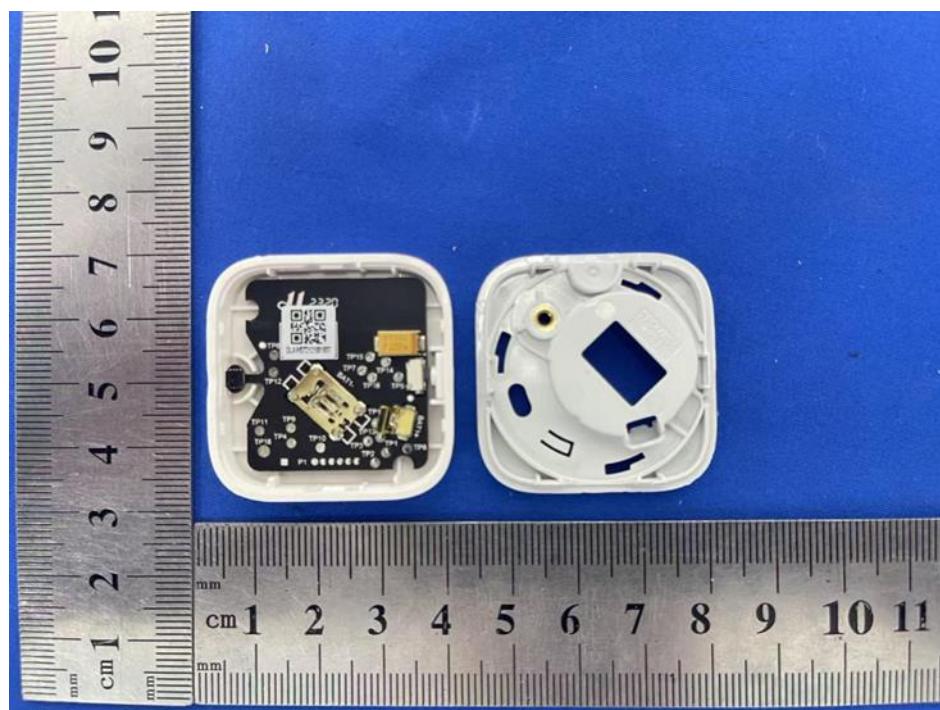


Figure 7 Internal view

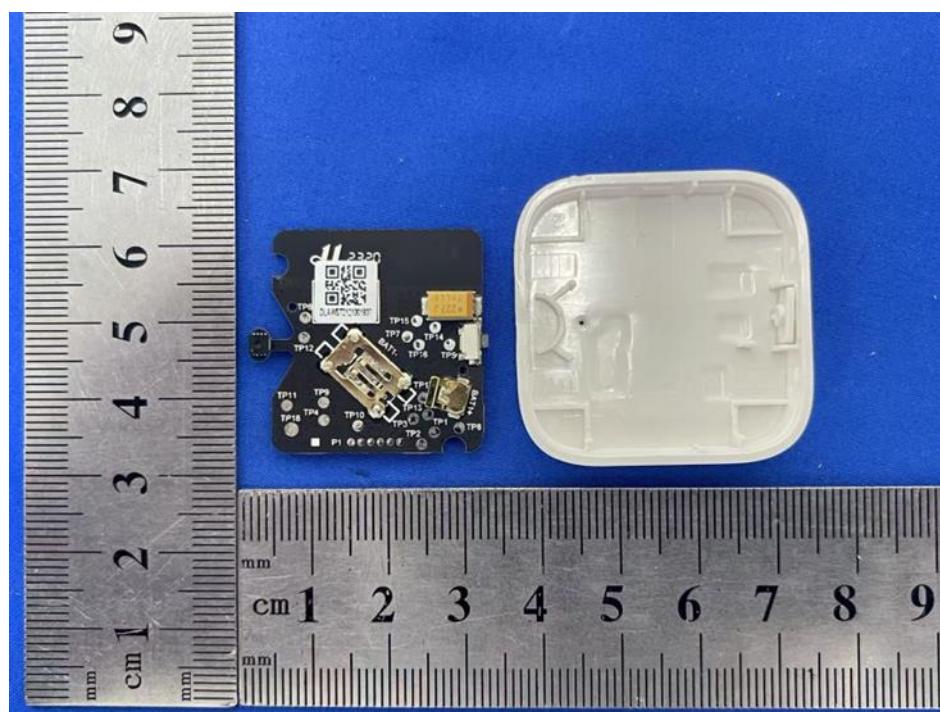


Figure 8 Internal view

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China
Inspection And Testing Society: yz.cnca.cn



Attachment 3

Photo Documentation

Page 90 of 90

Report No.: CTC2025222570

Product: Tempereture and Humidity Sensor T1

Type Designation: See Model/Type reference on page 3 of main report for details

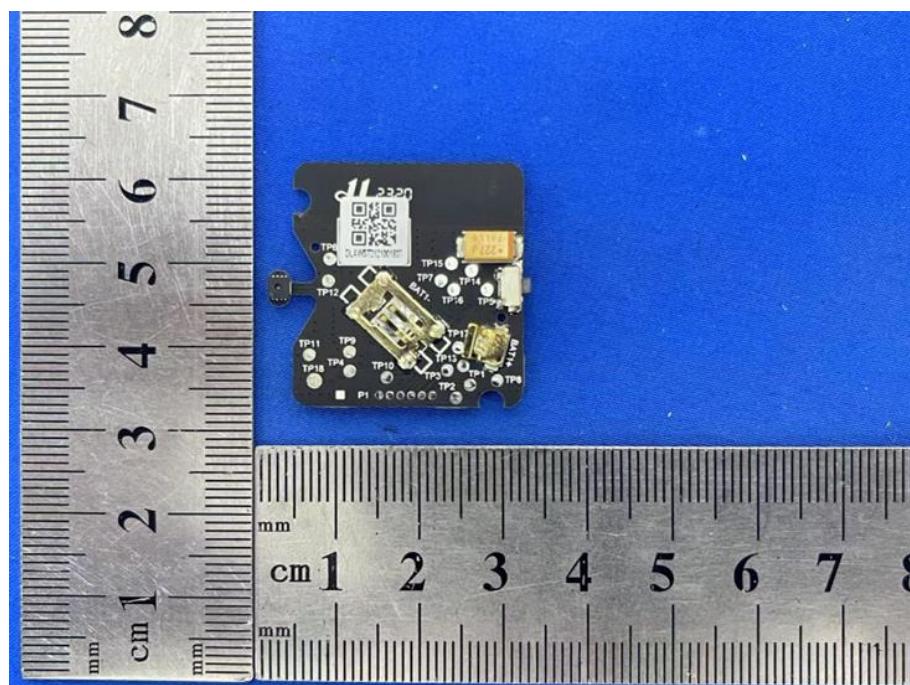


Figure 9 Internal view

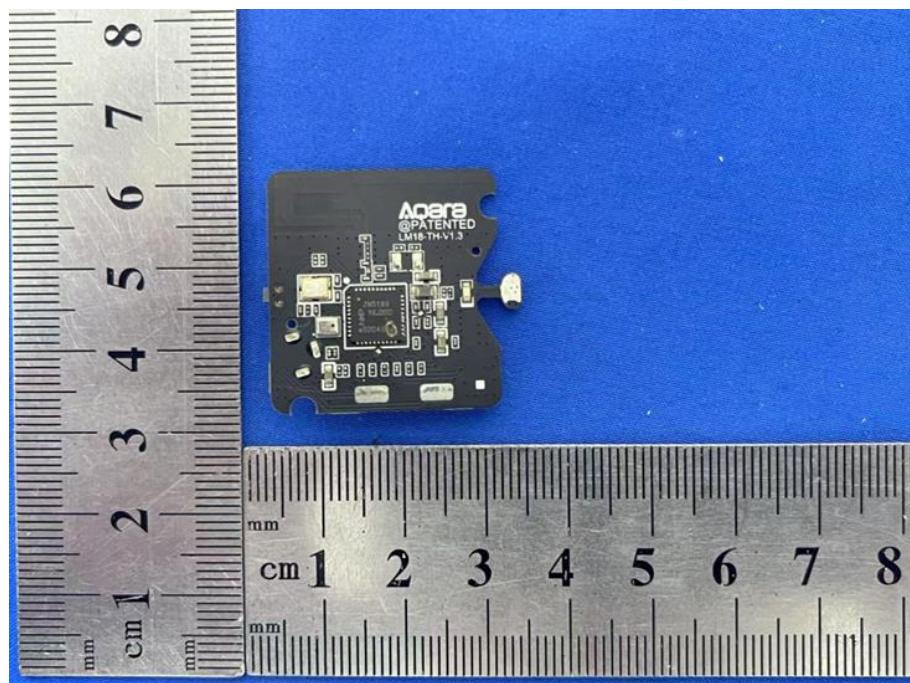


Figure 10 Internal view

*****THE END OF REPORT*****

CTC Laboratories, Inc

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China Tel.: (86)755-27521059 Fax.: (86)755-27521011 [Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)

TRF No.: CTC-TR-154_A1

For anti-fake verification, please visit the official website of China Inspection And Testing Society: yz.cnca.cn